GRiD®

GRiD 1755

GRiD 1755 User's Guide

The FCC wants you to know . . .

This equipment complies with the limits for a Class B digital device as specified in Part 15 of *FCC Rules*. These limits provide reasonable protection against radio and TV interference in a residential area. However, your equipment might cause TV or radio interference even when it is operating properly. To eliminate interference, you can try one or more of the following corrective measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and radio or TV
- Use different outlets for the equipment and the radio or TV

Shielded cables must be used with this equipment. If you add or replace any cables, the new cables must have shielding capabilities equal to or higher than those provided with the unit.

Consult a GRiD Systems Center or an experienced radio/TV technician if the problem still exists.

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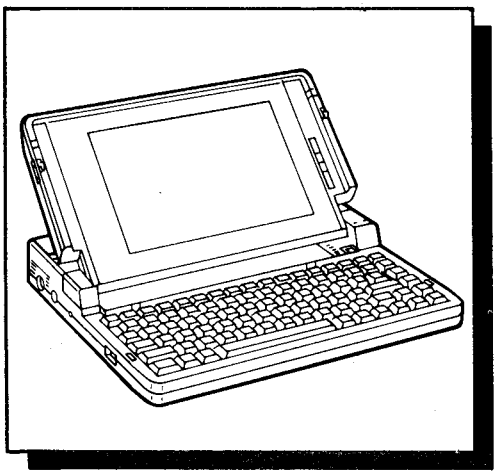
BEFORE YOU BEGIN



PACKAGE CONTENTS

Your GRiD 1755 package includes:

- Computer and the AC Adapter/Charger
- Rechargeable Battery
- Warranty Card
- Customer Information Card
- Three 720KB MS-DOS Diskettes
- One Utility Diskette
- 2400-bps/V.42 bis/FAX Internal Modem (optional)

You can immediately begin using your computer with the provided AC adapter. However, you must install and charge the supplied battery, as described in "Getting Started," before you can operate the computer from battery power.

ABOUT THIS BOOK

"Getting Started" and "Getting More" tell you about your computer and how to run applications.

"Changing Computer Functions" gives you information about some of the computer's basic functions and how to change them. The computer's Setup program (Set1755) lets you control some of the computer's basic operations, and the computer's Power program (Powr1755) lets you control the amount of battery power the computer uses.

Because your computer uses MS-DOS, a section called "Using MS-DOS" tells you about files and directories, and explains keys and key combinations you can use with MS-DOS. Following "Using MS-DOS," a section called "MS-DOS Quick Reference" lists and describes other MS-DOS commands.

"Appendix A — Internal Modem" tells you about your computer's internal modem. This section gives you information about how the modem works, how to connect the modem to a phone line, and how to troubleshoot the modem if a problem occurs.

TEXT CONVENTIONS

This manual uses a simple method of notation to differentiate text you type, keys you press, and what you see on the computer screen.

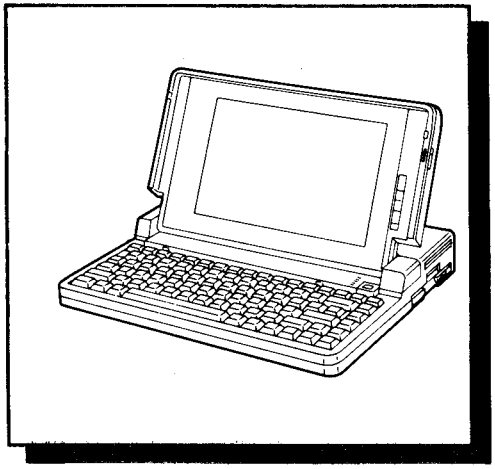
BACKSPACE — Key names that appear in small, heavy, capital letters represent keys you press.

CTRL+C — Two or more keys separated by a plus sign represent what we call a *key combination*. To use a key combination, press and hold down the first key. Then, press the other key(s).

`format` **ENTER** — Characters you type are displayed differently from the regular text in this manual. You must press **ENTER** after you type text. With most applications, you can type either uppercase or lowercase letters.

`A:\` — Characters that appear on the screen are also displayed differently from the regular text, like the example shown here.

INTRODUCTION



Your GRiD 1755 Notebook Computer is a state-of-the-art, 80386SX, 20 MHz, computer. It provides you with a complete, easy-to-use system.

STANDARD FEATURES

- IBM PC software compatibility
- Full portability
- 2 ½-inch 60MB or 80MB hard disk drive
- 3 ½-inch, 1.44MB diskette drive
- LCD display with fluorescent sidelight
- Full-feature, 84-key keyboard with full 101-key emulation and reversible **CTRL/CAPS LOCK** keys
- MS-DOS version 5.0 operating system
- Serial, parallel, external keyboard, and video ports that let you add options such as a printer, mouse, external keyboard, and VGA monitor
- Resume function
- Rechargeable battery
- 2MB RAM (expandable to 8MB)
- 2400-bps/V.42 bis/FAX internal modem (optional)

OPTIONAL FEATURES

You can add options to make your computer even more useful. For example, you can add a printer to print copies of the documents you create. You can connect a mouse to your computer's serial port. You can also add a VGA monitor, an external keyboard, a math coprocessor, and a 2MB or 6MB RAM (random access memory) module.

For more information about adding options to your computer, refer to "Getting More" in this manual.

GETTING STARTED

"Getting Started" provides information to help you set up and begin using your computer.

Cautions:

- Be sure you install all desired optional devices before you turn on your computer.
- Keep a reasonable clearance space around the computer and any optional device(s) to allow proper ventilation and prevent overheating.
- Avoid extreme temperature and humidity changes when you use, store, or transport your computer.

POWER SOURCES

You can power your computer from the supplied AC adapter or from the rechargeable battery. However, the battery comes fully discharged, so you must use the AC adapter as described below until you have completely charged the battery.

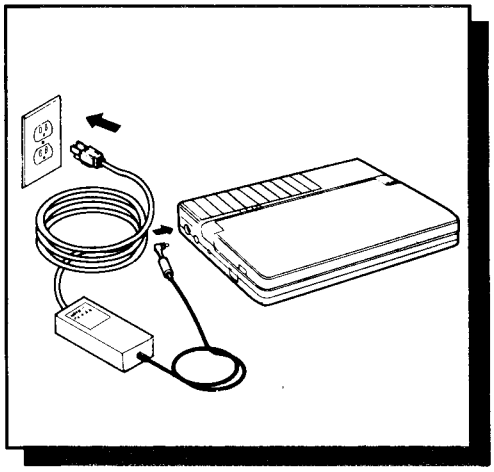
Using the AC Adapter and Charging the Battery

The following procedure tells you how to install the battery and how to connect the AC adapter that powers the computer and charges the battery.

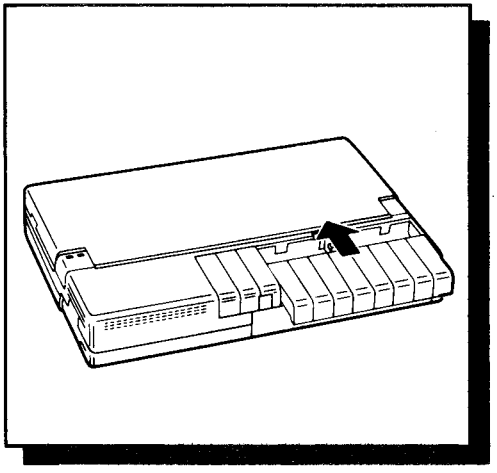
Cautions:

- Using an AC adapter other than the one supplied might damage the battery and the computer.
- Unplug the adapter from the AC outlet before you disconnect it from the computer.

1. Place the computer on a flat, level surface.
2. Slide the battery into the battery compartment.



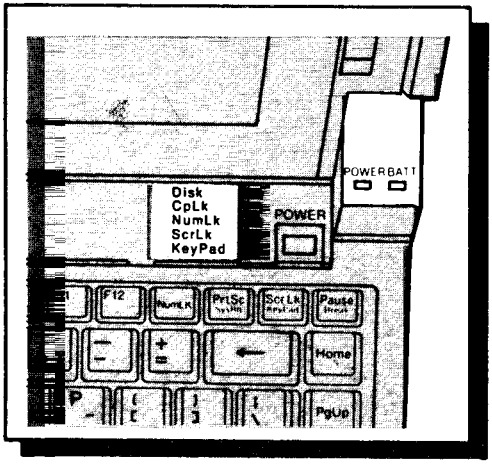
3. Insert the female end of the AC power cord into the corresponding outlet on the adapter.
4. Insert the AC adapter's barrel connector into the computer's **DC IN 16V** jack.
5. Plug the adapter into a standard AC outlet and let the battery fully charge before you use the computer on battery power. You can immediately begin using the computer on AC power.



Notes:

- The battery charges in 2 to 5 hours, depending on the type of computer activity. For example, if you use the computer while the battery charges and there is frequent hard/floppy drive access, the battery takes longer to charge.
- The computer's battery discharges slightly if the AC adapter is connected to the **DC IN 16V** jack, but not to an AC outlet.
- Do not store the battery in high temperature locations for extended periods.
- For more information about the care and use of the battery, see "Information About Rechargeable Batteries" in this manual.

Eventually, your computer's battery loses its ability to maintain a charge. This time period varies depending on use, storage conditions, and several other complex factors. When this occurs, you must replace the battery. Replace the battery only with the same type of battery (Cat. No. G25-4202) available from a GRiD Systems Center. Be sure to charge your new battery before you use it.



Low-Battery Indications

The **BATT** indicator and the computer's beeper tell you the condition of the battery in the following five ways:

- The indicator lights orange during charging.
- The indicator lights green when the battery is fully charged and the AC is supplying power.
- The indicator does not light if you run the computer on a fully charged battery and the AC adapter is not connected.
- The indicator lights orange and blinks if you remove the battery from the computer if AC power is being used or if the battery is damaged.
- The indicator lights red and a continuous tone sounds when battery power drops below the power level needed for normal operation. When this happens, save all important information and turn off the computer or connect the AC adapter.

  Note: The indicator might light red during disk operations. If the indicator turns off when the disk drive turns off, the battery still has plenty of power.

Cautions:

- When the **BATT** indicator lights red, a tone sounds until the computer automatically turns off. You have about 2 minutes to save your data to the hard disk or a diskette. To turn off the tone, press **FN+F5**.

- If battery power is too low for normal operation but you want to continue using the computer, connect the AC adapter or another fully charged battery. To prevent loss of data when you change the battery, attach the adapter to your computer and then to an AC outlet before you remove the battery.

  You can also prevent loss of data by saving your files, putting the computer into resume, removing the dead battery, installing the charged battery, and then taking the computer out of resume. See "Using The AC Adapter and Charging the Battery" in this manual.

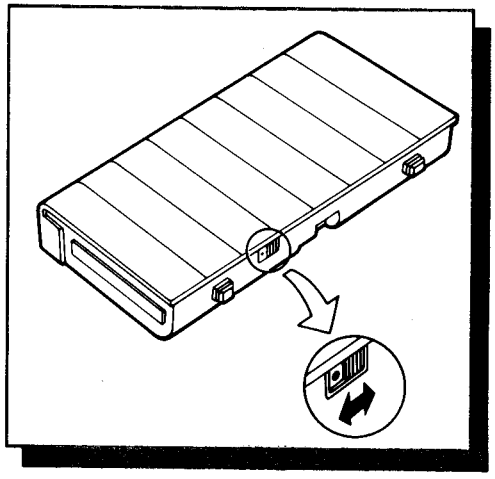
Information About Rechargeable Batteries

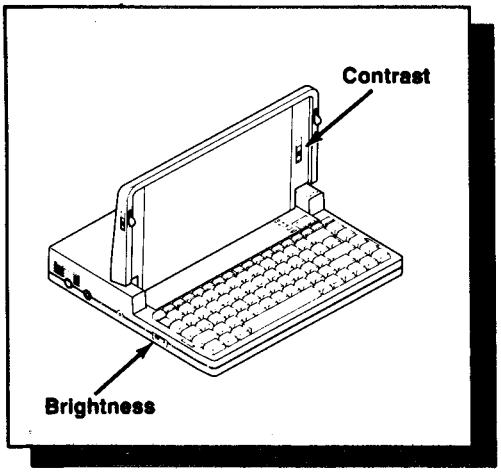
Your computer uses a nickel-cadmium rechargeable battery. The battery pack lasts longest if you occasionally — about once a month — operate the computer with battery power until the **BATT** indicator lights red and the computer turns off. Then, immediately recharge the battery.

You can power the computer for about 3 hours from a fully-charged battery. However, operating time varies depending on the options installed, backlight brightness, and the amount of diskette and hard drive access. For power conservation tips, see "Changing Computer Functions" in this manual.

Hints:

- You can buy another battery (Cat. No. G25-4202) at a GRiD Systems Center so that you can use your computer longer where AC power is not available.
- Use the battery's charge indicator to remind you if you have charged the battery or not. Set the indicator switch so that the red dot appears if the battery needs recharging. After you charge the battery, set the switch to the other position. (This indicator switch is mechanical only — it has no electrical function.)





STARTING YOUR COMPUTER

Follow these steps to start your computer.

1. To open the computer, slide the spring-loaded **OPEN** latch on each side of the cover toward the front of the computer and raise the display panel.
2. To turn on the computer, press and hold down **POWER** for about 2 seconds until the **POWER** indicator lights.
3. Tilt the screen for a comfortable viewing angle.
4. If necessary, adjust the **CONTRAST** control on the right of the display and the three–position **BRIGHTNESS** switch, located on the computer's left side.

SETTING A PASSWORD

You can protect your computer from unauthorized use by setting a password. If you set a password, you must enter it each time you turn on, reboot, or reset the computer.

To set, change, or disable a password, type:

```
setpass
```

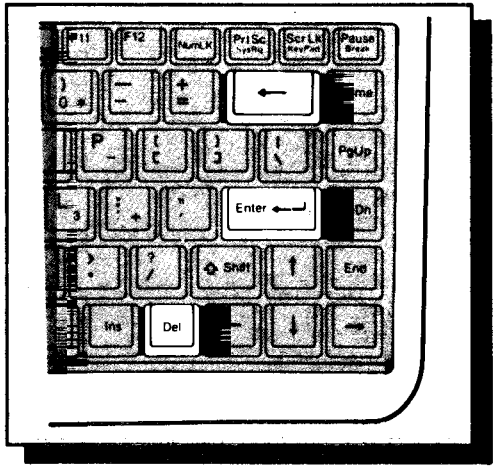
The password screen appears. This screen provides all the information you need to set a password, change an existing password, or disable the password.

USING A PASSWORD

Once you set or enable a password, you must enter the exact password each time you turn on or reboot your computer, to access your files or programs. When you turn on the computer and Resume is not active, or, if you reset or reboot the computer, the message *enter password* appears on the screen. Enter your password at this prompt. When you turn on the computer and Resume is active, a rising tone sounds. When you hear the tone, enter your password.

You have three tries to enter the correct password. If you enter a third incorrect password after you reset or reboot the computer, the computer automatically reboots. If you enter a third incorrect password after you turn on the computer when Resume is active, the computer re-enters the suspend mode. If you forget your password, call the GRiD Resource Center at 1-800-654-GRID (4743) for assistance.

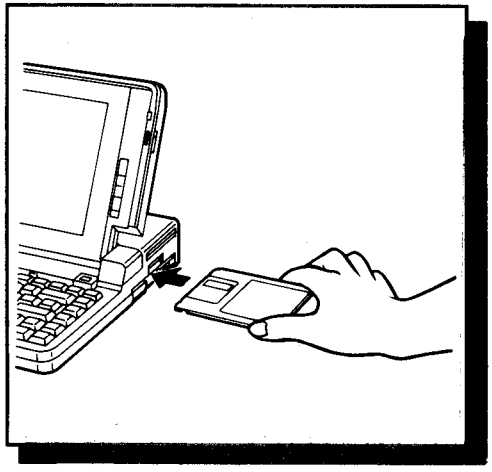
OPERATING YOUR COMPUTER



You do not need to know every key's function to use your computer. In fact, many keys have different functions, depending on what application you run. In general, you use the keyboard like a standard typewriter's keyboard. For example, use the computer's **ENTER** key like the typewriter's return key; use the backspace key to erase previous characters; or press **DEL** to erase a character at the cursor's current position.

Your computer has some keys that are not on a standard typewriter, however. The functions of these extra keys vary depending on the application you use. For more information about these extra keys, see "Using the Keyboard" in this manual.

USING THE DISKETTE DRIVE

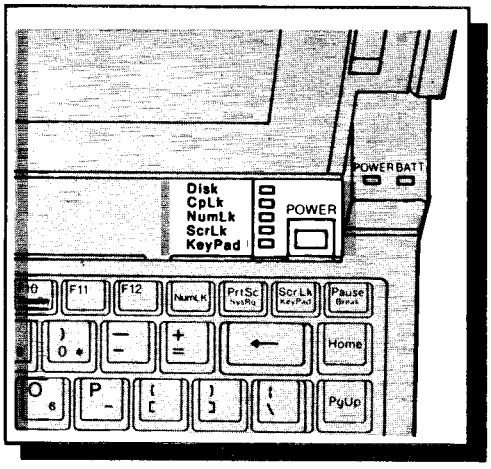


If you want to access data or applications that are on diskettes, or save data or applications to diskettes, insert a diskette into the drive slot, as shown.

To remove the diskette from the drive, press the eject button until the diskette ejects.

Be sure to handle diskettes carefully. A scratch, small dent, or dust can destroy data on a diskette. To protect your diskettes (and the information they contain) from damage, follow these guidelines.

- Never insert more than one diskette into the drive.
- Do not use damaged diskettes.
- Keep diskettes away from magnetic fields (such as transformers, AC motors, magnets, TVs, and radios).
- Handle diskettes with the metal shutter closed. Never touch the material inside the diskette.
- Keep diskettes out of direct sunlight and away from excessive heat.
- Keep diskettes away from cigarette ashes, dust, and other small particles.



You can configure your GRiD 1755 in many different ways and use many different types of software. Resume might not work with some configurations and software. See "Appendix C: Configurations" for more information.

TURNING OFF YOUR COMPUTER

Before you turn off your computer, we recommend that you properly exit any application, return to the system prompt (A> or C>), and remove any diskette from the drive (whether or not Resume is on). Then, press and hold down **POWER** for about 1 second to turn off the computer.

Cautions:

- Be sure to save data to a diskette or the hard disk before you turn off the computer, even if you are using Resume.
- Always follow the instructions in the software documentation for exiting an application.
- Do not turn off the computer while the **Disk** indicator or the diskette disk drive indicator is on. These indicators show that the computer is reading from or writing to the hard disk or diskette. Turning off the power at these times can cause a loss of data.

USING RESUME

The Resume feature lets you turn off your computer while running an application and return to the same point in the application the next time you turn on the computer. This saves you from reloading the application and helps you conserve power when you use the battery.

Your computer comes with the Resume feature turned off. You must use the Set1755 program to turn on Resume. You can also set the computer to automatically enter the *suspend* mode after a set length of idle time. The suspend mode automatically turns off the computer only when you use battery power and Resume is on. When you turn the computer back on, Resume returns to the application. See "Changing Computer Functions" in this manual.

Cautions:

- The Resume feature works only if you turn off the computer with the **POWER** button while it is operating on battery or AC power, or if the computer is turned off automatically by the suspend mode feature. If you let the battery completely run down or if you disconnect both the battery and AC power from the computer before you turn it off, Resume does not work and you lose any unsaved data.

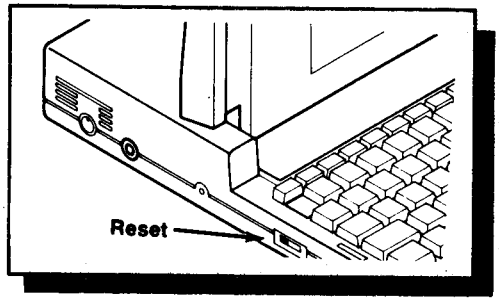
- The Resume feature might not work with all applications, so be sure to save all data to a diskette or the computer's hard disk before you turn off the computer, even if Resume is on.

The length of time Resume remembers your place within an application depends on how much RAM your computer has and on the condition of the battery. (See "Adding an Internal RAM Module" in this manual.) The following chart lists the length of time Resume remembers.

Additional RAM Installed	Fully Charged Battery	No Battery or Dead Battery
None	4 Weeks	24 Hours
2MB	2 ½ Weeks	15 Hours
6MB	1 Week	6 Hours

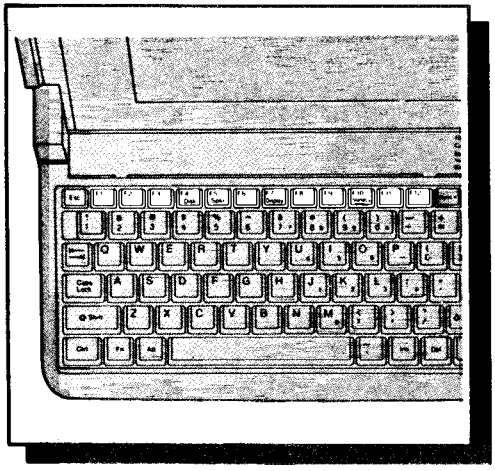
Notes:

- An internal resume battery powers the resume feature. This battery must recharge periodically, but to do so, the external battery must be installed and adequately charged.
- If you turn on the computer after the specified time limit Resume can remember, the computer starts up as usual and unsaved data is lost.
- Some applications might lock up when you try to use the Resume feature. If this happens, restart the computer by using the tip of a pen to press the **RESET** button on the computer's left side. **Any unsaved data is lost.**

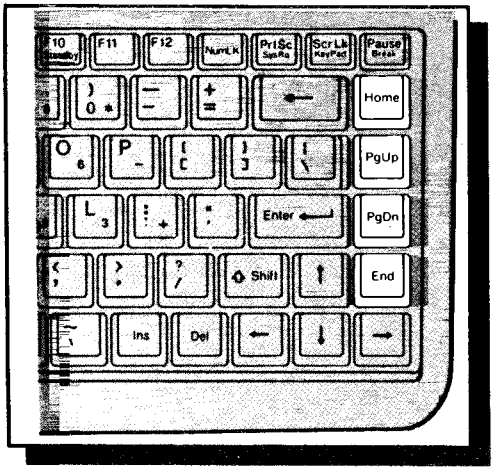


USING THE KEYBOARD

Your computer's keyboard consists of four sections: the function keys, the typewriter keys, the numeric keypad area, and the arrow keys.



Function Keys — The way the function keys operate depends on the application you run. Some of these keys perform special functions when the computer is not running an application. See "Changing Computer Functions" in this manual.

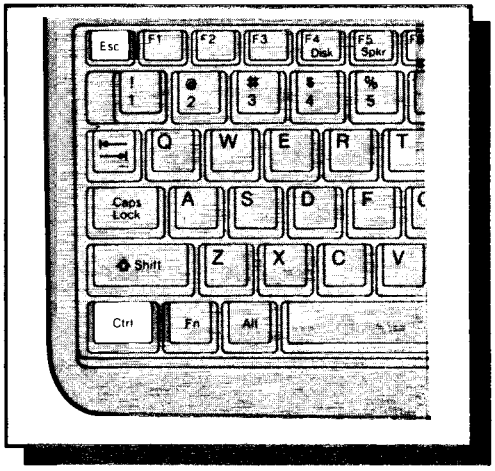


Typewriter Keys — The main part of the keyboard is similar to the keyboard of a standard typewriter. However, the functions of these keys depend on the applications you run. This section of the keyboard also contains the following keys not found on a standard typewriter.

HOME	Starts a *home* function. In some applications, pressing **HOME** moves the cursor to the upper left corner of the screen.
END	Starts an *end* function. In some applications, pressing **END** moves the cursor to the right of the last character in the current line.
PGUP	Starts a *page up* function.
PGDN	Starts a *page down* function.

ESC

The **ESC** (escape) key is often used to cancel various functions or select options in a program.



CTRL

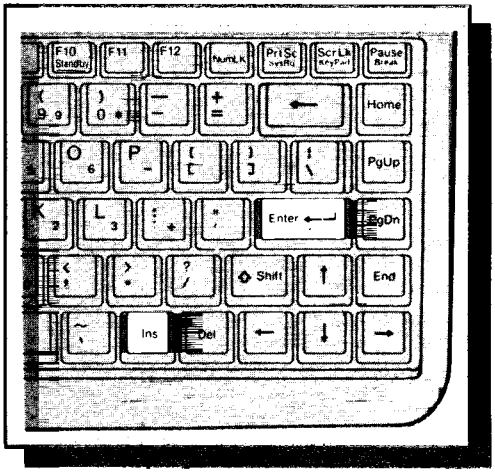
The **CTRL** key is used with certain other keys to perform specific operations. The combinations available and their functions depend on the application you run. To use a **CTRL** key combination, hold down the **CTRL** key and press the other key. For example, **CTRL+C** performs a *break* or *program interrupt* in many applications. See "Reversing CTRL and CAPS LOCK Keys" in this manual.

Notes:

- Some software manuals refer to **CTRL** as **CNTRL**.
- In some applications, the right and left **CTRL** keys are not interchangeable and might be used to perform separate functions. Your computer has only a left **CTRL** key, but you can press **FN+CTRL** to emulate the right **CTRL** key function.

ENTER

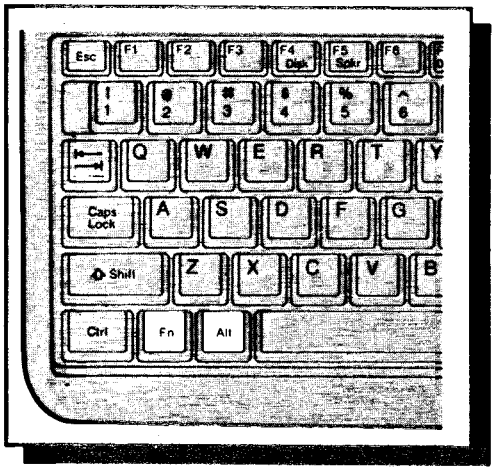
The **ENTER** key enters typed commands and information into the computer. After you press **ENTER**, the application or operating system your computer is running processes the command you typed.



Note: Some software manuals might refer to **ENTER** as **RETURN**, **CR**, or ↵.

INS

The function of the **INS** key depends on the application you run. In some applications, this key changes the typing mode from the normal overstrike (typeover) mode to the insertion mode so that you can insert information into a line of text. Pressing the key again returns the application to the overstrike mode.



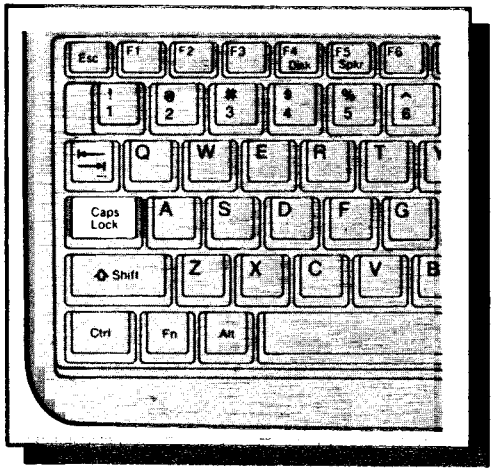
FN

Use **FN** in combination with certain keys to control special hardware functions of the 1755.

ALT

Use the **ALT** key in combination with certain other keys to perform specific operations. The combinations available and their functions depend on the application you run. To use an **ALT** key combination, hold down **ALT** and press the other key.

Note: In some applications, the right and left **ALT** keys are not interchangeable and may be used to perform a separate operation. Your computer has only a left **ALT** key, but you can press **FN+ALT** to emulate the right **ALT** key function.



CAPS LOCK

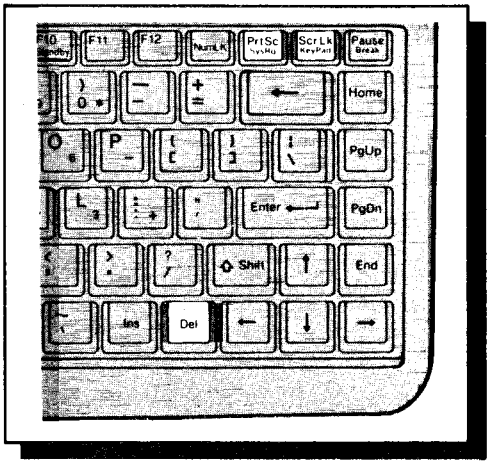
Pressing **CAPS LOCK** causes the alphabet keys to produce only capital letters. (This function affects only the keys A-Z.) Press this key once to activate the mode. The **CAPS LOCK** indicator lights green. Press the key again to return to the normal typing mode. See "Reversing CTRL and CAPS LOCK Keys" in this manual.

DEL

The function of the **DEL** key depends on the application you run. In some applications, this key deletes the character at the current cursor position.

FN+KEYPAD

The **FN+KEYPAD** key combination activates the numeric keypad area. The **KEYPAD** indicator lights green when you press this key combination. The keypad area includes the numbers, operators (–, +, /, and *), and punctuation, labeled in red on the keyboard. Press the combination again to return to the normal keyboard function. For information about the alternate arrow keys and other keypad functions, see "Numeric Keypad Area" in this manual.



SCRLK — The function of the **SCRLK** (scroll lock) key depends on the application you run. The use is defined in your operating system or application manual. When you press this key, the **SCRLK** indicator lights green.

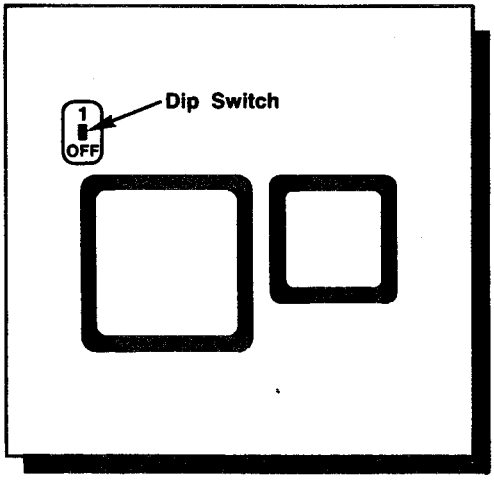
SHIFT+ PRTSC — Sends everything displayed on the screen to the printer.

CTRL+ PRTSC or CTRL+P — Toggles the printer echo function on and off. When the printer echo is on, everything you type goes to the printer.

CTRL+SCRLK — The function of this key combination depends on the application you run. In some applications, this combination stops the application from running.

Reversing CTRL and CAPS LOCK Keys

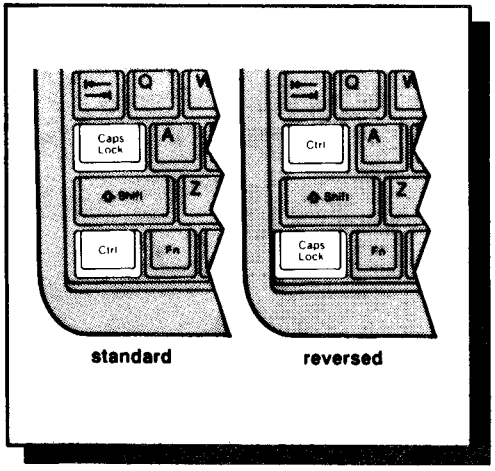
The GRiD 1755's keyboard comes with the **CTRL** and **CAPS LOCK** keys in their standard positions. However, you might prefer to reverse the positions of these keys. We recommend that you ask your local GRiD Systems Center to do this for you. However, if you prefer to do it yourself, follow these steps:



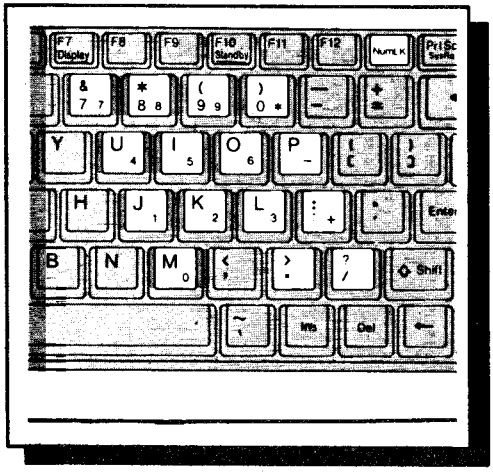
1. Exit the current application and turn off your computer.
2. Remove the two screws from the compartment cover on the bottom of the computer. Then, remove the cover.
3. Use a small pointed object, such as the tip of a pen, to set the position of the dip switch.

   You can set the dip switch in one of the following ways:

   - Set the switch to 1 to reverse the **CTRL** and **CAPS LOCK** key positions.
   - Set the switch to **OFF** to restore the standard **CTRL** and **CAPS LOCK** key positions.



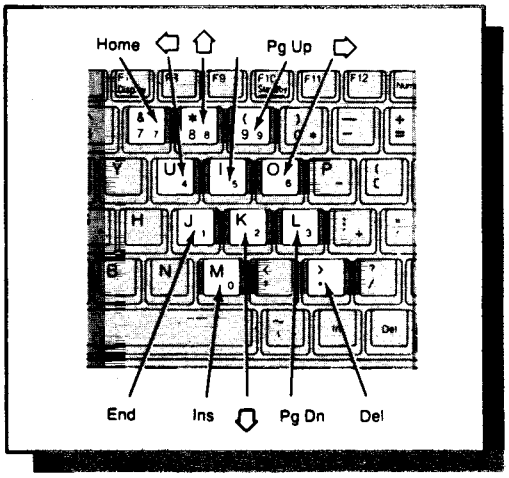
4. Replace the compartment cover and reinstall the cover's screws.
5. Remove the **CAPS LOCK** and **CTRL** keycaps, using a keycap puller. Then, reverse and re-install the keycaps.
6. Turn on your computer.
7. Press **RESET** on the computer's left side (if Resume is enabled).



Numeric Keypad Area

The keyboard's numeric keypad area is similar to a calculator keypad. Press **FN+KEYPAD** to use the keypad for extensive number entry; the **KEYPAD** indicator lights green. If the **NUMLK** indicator is not lighted, press **NUMLK**. The values of the numeric keypad keys are 0-9, decimal (.), plus (+), minus (–), multiplication (*), and division (/). These values are printed in red on the keyboard. Press **FN+KEYPAD** again to return to the normal keyboard function.

You can also use the keyboard's numeric keypad area to emulate other keypad functions of a 101-key keyboard. If you turn off the **NUMLK** indicator while the keypad is active, the numeric keypad area provides alternate cursor keys, and alternate **HOME**, **END**, **PGUP**, **PGDN**, **INS**, and **DEL** keys. Some applications require you to use the keypad area versions of these keys rather than the separately provided keys. Press **NUMLK** to switch between numeric key entry and the alternate functions. See the diagram at the right and the chart below for the standard and alternate functions.

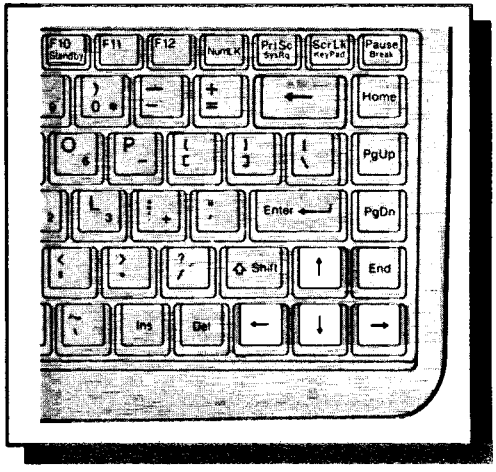


Indicator Status	Result
KEYPAD ON **NUMLK ON**	**Numbers** — (with **SHIFT** held down, alternate function keys)
KEYPAD OFF **NUMLK OFF**	**Letters** — (with **SHIFT** held down, shift characters)
KEYPAD ON **NUMLK OFF**	**Alternate Functions** — (with **SHIFT** held down, numbers)
KEYPAD OFF **NUMLK ON**	**Letters** — (with **SHIFT** held down, shift characters)

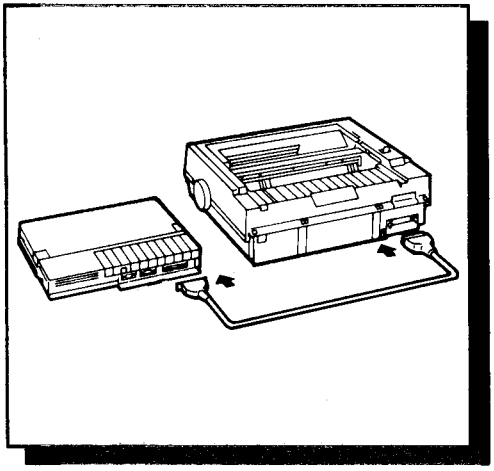
Arrow (Cursor) Keys

Use the arrow keys at the lower right of the keyboard to move the cursor. Pressing an arrow key moves the cursor one position in the direction of the arrow. Holding down an arrow key repeats the action.

Note: In some applications, the arrow keys perform a separate function.



GETTING MORE



You can get even more from your computer by adding options such as a printer, mouse, modem, external keyboard, and math coprocessor. For example, you can add an optional printer to print copies of the documents you create.

ADDING AND USING A PRINTER

You can connect a printer to your computer's parallel port.

1. Prepare the printer for parallel operation according to its user's guide.
2. Turn off your computer.
3. Pull down the hinged cover for the serial/parallel/RGB (video) port compartment.
4. Connect the printer cable's DB-25 connector to the connector in the port compartment labeled **PARALLEL**.
5. Connect the printer cable's other end to the printer.
6. Turn on the computer first. Then, turn on the printer.

You can use the printer with most applications. Be sure your software is set up to work with the printer. Check your application's documentation and your printer's user's guide for information about setting up and using your printer.

Note: To operate a printer with the computer, see "Changing Computer Functions" in this manual for information about setting the computer's parallel port for either unidirectional or bidirectional operation. (You can also set up the port for use with an optional, external diskette drive.)

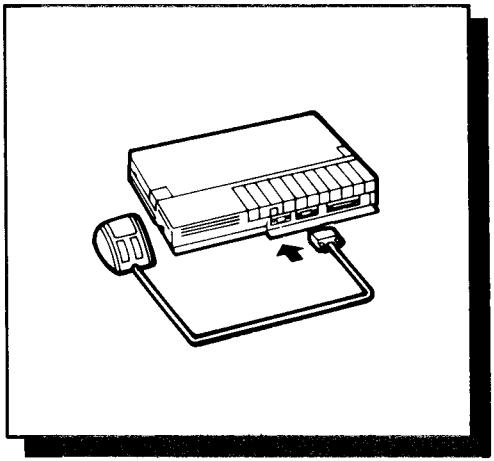
ADDING A MOUSE OR OTHER SERIAL DEVICE

You can connect a serial mouse, external modem, or other serial device to your computer's built-in serial port.

1. Prepare the serial device according to its owner's manual.
2. Turn off your computer.
3. Pull down the hinged cover to open the serial/parallel/RGB port compartment.
4. Connect the serial cable's DB-9 connector to the connector in the port compartment labeled **SERIAL.**
5. Turn the computer back on.

Notes:

- To operate a serial device with the computer, see "Changing Computer Functions" in this manual for information about setting the computer's serial port and modem addresses.
- Serial devices you connect might require other software. Check the device's owner's manual.

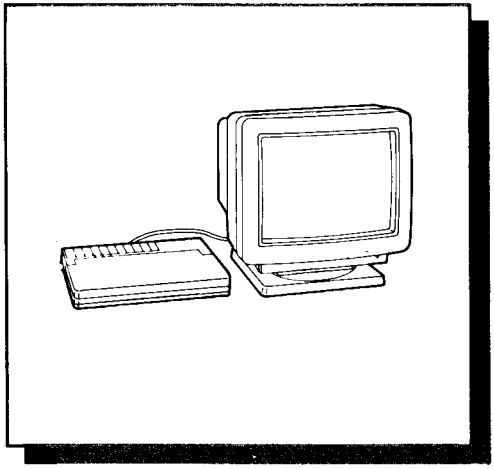


ADDING AN EXTERNAL VGA MONITOR

You can connect an external VGA monitor to your computer's built-in video port.

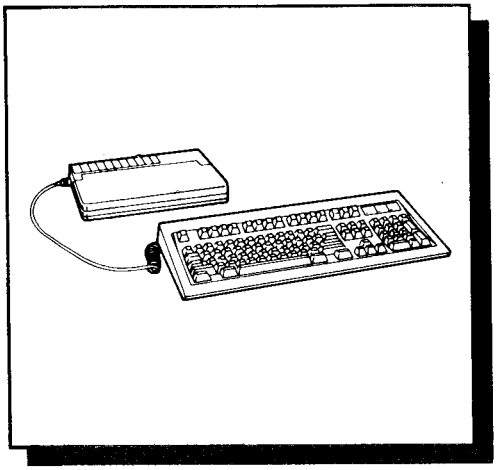
1. Prepare the monitor according to its owner's manual.
2. Turn off your computer.
3. Pull down the hinged cover to open the serial/parallel/RGB port compartment.
4. Attach the monitor's cable connector to the connector in the port compartment labeled **VIDEO.**
5. Turn the computer back on.

Note: For more information about using an external VGA monitor with the computer, see "Using the Setup Program" or "Special Key Combinations" in this manual.



ADDING AN EXTERNAL KEYBOARD

You can connect a PS/2-compatible external keyboard to your computer's built-in external keyboard port.



1. Prepare the keyboard according to its owner's manual.
2. Turn off your computer.
3. Connect the keyboard's mini-DIN connector to the connector on the computer's left side labeled **EXT KB.**
4. Turn the computer back on.

Notes:

- The **EXT KB** connector does not support a PS/2-style mouse.
- You can use both the computer's keyboard and an external keyboard at the same time with the computer.

ADDING A MATH COPROCESSOR

Graphical design applications or applications that perform a large number of mathematical computations require your computer to do a lot of work. These types of applications can take additional time to run unless you have an optional math coprocessor (Cat. No. G90-2311) in your computer. A coprocessor allows your computer to run these types of applications much faster.

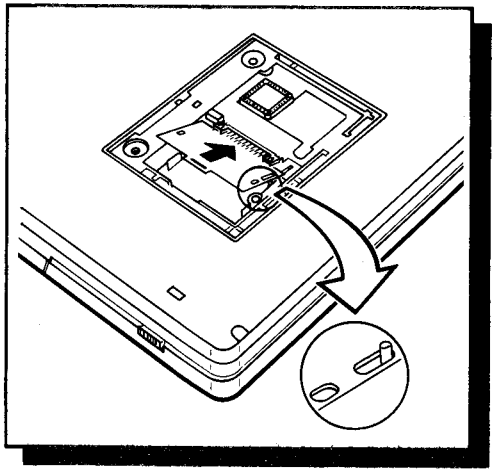
We suggest you go to your local GRiD Systems Center for the purchase and installation of a coprocessor. If you prefer to install the processor yourself, follow these steps:

1. Exit any application you might be in and turn off your computer.
2. Remove the cover on the bottom of the computer.
3. Position the math coprocessor in the socket, as shown. Use the slanted corner on the chip and the slanted inside corner of the chip's socket as guides to properly align the chip.

   Cautions:

   - Be sure to correctly position the math coprocessor. Once you install the coprocessor, you must use a special chip extraction tool if you want to remove the coprocessor.
   - Be sure you touch a grounded metal object before you handle the coprocessor.

4. Press down the math coprocessor until it snaps into place.
5. Replace the cover.
6. Turn on your computer.
7. Press **RESET** on the side of the computer so that the computer will recognize the coprocessor.



ADDING AN INTERNAL RAM MODULE

Your computer comes with 2MB of RAM. However, you can install an internal 2MB module for a total of 4MB of memory, or a 6MB module for a total of 8MB of memory.

The computer has 640KB of standard memory and 384KB of extended memory. Depending on the requirements of the operating system and the applications you run, you can configure extra memory you add as extended or expanded memory. You must use an EMS device driver (such as temm1755.sys) to configure the memory as expanded memory (EMS).

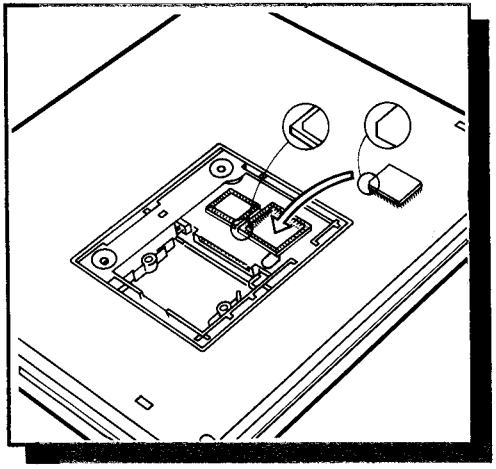
Cautions:

- Use only the specified RAM modules with your computer.
- Do not drop foreign objects, such as a paper clip, into the RAM module compartment. A short circuit can seriously damage your computer.

To install a RAM module, follow these steps:

1. Disable the computer's Resume function, and turn off the computer's power. (See "Changing Computer Functions.")
2. Remove the cover from the bottom of the computer, and remove the two screws from the bottom of the compartment.
3. Position the module so that the letter B faces up. Then, install the module by gently pushing it into the slot until it snaps into position. The module's oval slot fits over the pin in the computer. Secure the module using the two screws.
4. Replace the cover. Then, turn on the computer.
5. Press **RESET** to restart the computer.
6. Run the Set1755 setup program. (See "Using the Setup Program.) This allows the computer to recognize the additional memory.
7. To configure the extra memory as expanded memory, install the temm1755.sys file device driver using an MS-DOS text editor, such as EDIT.COM. Place the following line in the computer's config.sys file.

```
device=c:\dos\temm1755.sys /M=n
```



Note: The n in the previous step represents the amount of extended memory used as expanded memory. The number you enter in this space depends on the extended memory available in your computer and the Shadow RAM setting in the Setup program. (See "Changing Computer Functions.")

8. Press **RESET** again to restart the computer and load the EMS driver.

CHANGING COMPUTER FUNCTIONS

INTRODUCTION

Your GRiD 1755 computer uses two programs and special key combinations that let you control some of the computer's parameters. These also let you set the computer to use less power when you use battery power. The programs are called *Set1755* and *Powr1755*.

The Set1755 program lets you select system parameters and store the parameters you select in memory. Each time you turn on the computer, it uses these parameters.

You can control system parameters such as the CPU Speed, Shadow RAM setting, Parallel Port mode, Serial Port enable and disable, Video selections, Color Map setting, and various timeouts.

The Powr1755 program lets you temporarily change the power-management parameters without restarting the computer. However, changes you make using this program are not stored in memory when you turn off the computer, and when you restart the computer, it returns to the parameters you stored using the Set1755 program.

The power management parameters let you set the hard drive and display to automatically turn off after a selected period of inactivity. Of course, you can turn on the hard drive and display whenever you need them. You can also set the standby mode to automatically activate when there is no diskette drive, hard drive, port, or keyboard activity.

Note: You cannot enable power management parameters when using AC power. If you make changes, the changes are ignored until you unplug the AC adapter and switch to battery power.

When you run Set1755 or Powr1755, you select parameters from easy-to-use menus. See "Using the Setup Program" and "Using the Power Program" in this manual.

PARAMETER DEFAULTS AND DESCRIPTIONS

Now that you understand the basics of the Set1755 and Powr1755 programs, use the following information and procedures to set the GRiD 1755 to work the way you want it to. The following chart lists the parameters and their factory settings. After the chart are brief descriptions of each parameter.

SPEAKER/DATE/TIME/CPU	
Speaker	ON
Date	Valid Date
Time	Valid Time
CPU Speed	Fast
START UP	
Boot Device	Hard Disk
Monitor	LCD
Num Lock Light	ON
Shadow RAM	NO
COMMUNICATIONS	
Serial Ports	Enabled
Addresses	Normal
Parallel Port	Printer
Bidirection	YES
Floppy*	B: 1.44MB 3.5"
VIDEO	
Mode	VGA
Expanded	YES
Max Contrast	Disabled
Cursor Type	Line
POWER/COLOR MAP	
Management	On
Resume Mode	Off
Color Map	1
Reversed	YES
TIMEOUTS	
Suspend Mode	00 Minutes
Standby Mode	08 Minutes
Display	04 Minutes
Hard Drive	01 Minutes

* This parameter appears only when you select *Floppy* as the parallel port device.

Note: The Management, Suspend Mode, Standby Mode, Display, and Hard Drive settings have no effect when you are using AC power. However, any new settings go into effect if you unplug the AC adapter andswitch to battery power.

Speaker — lets you turn the computer's speaker on or off.

Date and Time — lets you set the computer's date and time for MS-DOS.

CPU Speed — lets you select your computer's speed. You can choose 10MHz or 20MHz.

Boot Device — lets you select whether the computer starts up (boots) from the hard disk or the floppy disk.

> **Note**: You can override this setting by pressing **F** (floppy disk) or **H** (hard disk) within 2 seconds after the beep sounds during start up.

Monitor — lets you choose to use the built-in LCD screen or an external VGA monitor (CRT).

Num Lock Light — lets you set the **NUMLK** indicator to automatically turn on when you turn on the computer.

Shadow RAM — assigns the RAM between 640KB and 1MB as *Shadow RAM*. With the Shadow RAM option set to *NO*, 384K will be used for extended memory. With the Shadow RAM option set to *YES*, part of this memory will shadow the machine BIOS and part of it may be used by temm1755.sys, emm386.exe, or other memory managers. This results in slightly faster performance for some software.

Serial Ports — let you turn the serial ports on or off.

> **Addresses** — assigns the serial port and modem addresses. You can choose the normal addresses (COM1 as the serial port and COM2 as the modem), or you can swap the addresses.

Parallel Port — lets you choose to use the parallel port with a printer or an external floppy diskette drive.

> **Bidirectional** — if you choose the *Printer* option for the parallel port, you can select *YES* for bidirectional printer operation or *NO* for unidirectional operation.
>
> **Floppy** — if you choose the *Floppy* option for the parallel port, this parameter lets you set the port for Drive A or Drive B in 360KB, 720KB, 1.2MB, or 1.44MB storage volumes, using a 3 ½- or 5 ¼-inch external drive. If you assign the external drive as Drive A, the computer automatically reassigns the internal diskette drive as Drive B.

Mode — sets the video emulation mode to VGA, CGA, EGA, or MDA for the computer's LCD display or an external VGA analog monitor. Select the video mode specified by the application you are running. Most software will run with this option set to VGA.

Expanded — in the VGA mode, lets you choose between the normal display character set and an expanded set that is slightly taller than normal and uses the entire LCD screen.

Max Contrast — when enabled, provides maximum contrast between the foreground and background and lets you press **FN+ALT+F1** to switch between normal and reverse video. When disabled, lets you press **FN+F1** to switch between 7 combinations of shades of gray for each video screen (normal and reverse). Choose the setting that looks best with the application(s) you are using.

Notes:

- When using an external color monitor, the shades of gray appear as colors.
- You cannot change the setting while running some applications or while using an external monitor.
- When Max Contrast is enabled, it has no effect on an external monitor.

Cursor Type — lets you select a line or block type cursor.

Management — saves battery power by operating the computer at a lower speed when there is no keyboard or disk activity.

> **Note**: The computer might require more time to perform internal calculations (such as those for large spreadsheets or similar applications) when Management instructs the computer to operate at a lower speed. To operate the computer at 10MHz or 20MHz, turn off Management. (See "Changing Computer Functions.")

Resume — turns on or turns off the Resume feature. (See "Using Resume.")

> **Note**: For Resume to work properly, you must turn off the computer before you disconnect its power (or before the battery runs down).

Color Map — lets you specify a preset color map (1-7) to make the display more readable for certain applications. You can reverse the screen colors by pressing **FN+ALT+F1**.

> **Note:** You can also set the colormap from MS-DOS. To do so, switch to the `C:\DOS>` directory. Then, type `colormap`, followed by a space and the desired colormap setting (1-7), and press **ENTER**. If you use this method, you override the colormap setting in the Setup program. To display the current colormap setting, type `colormap` and press **ENTER**.

Reverse Video — lets you select *YES* to display information using a black foreground on a white background, or *NO* to display information using a white foreground on a black background.

Suspend Mode — tells the computer to enter the Resume mode after a specified time period of port, hard disk, and keyboard inactivity. The Resume mode option must be set to *ON* for the suspend mode to have any effect.

Standby Mode — selects the number of minutes of system inactivity before the display and hard drive turn off. Press any key to turn on the computer's hardware.

> **Note:** During the standby mode, any program you are running is suspended and your computer operates at a very low current. Even though the display and hard drive are off, you can resume the program by pressing any key.

Display — selects the number of minutes of keyboard inactivity before the display turns off. Your computer turns off the display after 1, 2, 4, 8, or 16 minutes. The display stays on if you select *00*.

Hard Drive — selects the number of minutes of hard disk inactivity before the hard disk turns off. You can set the timeout for 1, 2, 4, 8, or 16 minutes. The hard disk stays on if you set the timeout to *00*.

USING THE SETUP PROGRAM

To run the Setup program, follow these steps:

1. Exit any application you might be running.
2. If you are not in Drive C, type:

   `c:` **ENTER**

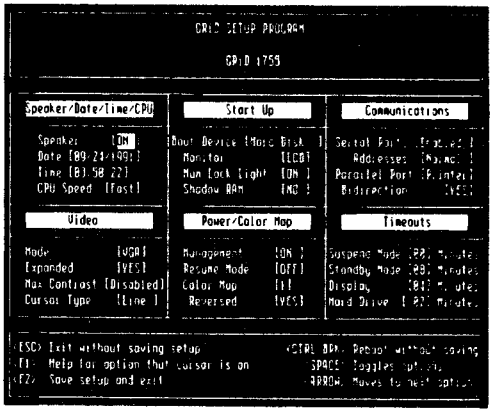
3. Select the DOS directory by typing:

   `cd \dos` **ENTER**

4. At the MS-DOS prompt, type:

   `set1755` **ENTER**

   The Set1755 program screen appears.



5. Use the arrow keys to select the parameter you want to change and enter the numbers or press the space bar to step through the available settings.
6. Press **F2** if you want to save your changes.

- If you do not want to save the changes, press **ESC**.
- If you want help information about a highlighted topic, press **F1**.

USING THE POWER PROGRAM

The Power program lets you:

- Set the power management parameters
- Enable and disable the serial ports
- Set the Hard Disk timeout
- Set the Display timeout
- Set the Standby Mode timeout
- Enable or disable the Resume Mode
- Set the Resume Mode timeout

To run the Power program, follow these steps:

1. Exit any application you might be running.
2. If you are not in Drive C, type:

   c: **ENTER**

3. Select the DOS directory by typing:

   `cd \dos` **ENTER**

4. At the prompt, type:

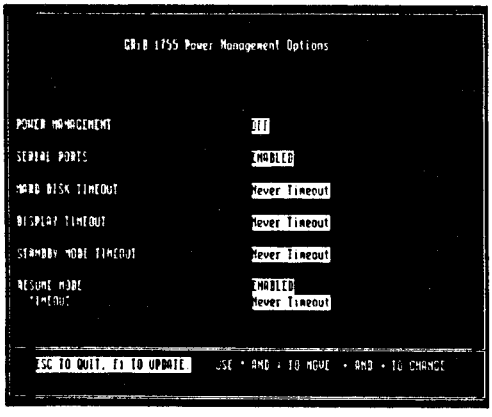
   `powr1755` **ENTER**

   The Powr1755 program screen appears.

   Use the up and down arrows to select the parameter you want to change. Then, press the left and right arrows to choose the setting for the parameter.

5. Press **F1** to immediately activate your changes.

   If you do not want to activate your changes, press **ESC**.



Notes:

- Any changes you make while using AC power are ignored.
- If Resume is enabled before you turn off the computer, when you turn it on again, the computer remembers the settings you selected in the Powr1755 program.
- If you restart your computer by pressing **RESET** or **CTRL + ALT + DEL**, the computer returns to the settings you selected using the Set1755 program. Any settings you selected using the Powr1755 program are lost.

COLORMAP

Your computer comes with a colormap utility that lets you make the computer's display more readable for certain applications. You can choose from seven different colormap settings.

To display the current colormap, type:

`colormap` **ENTER**

To change the colormap setting, type `colormap`, followed by the desired colormap setting (1-7). Then, press **ENTER**.

Note: The colormap setting you select using the COLORMAP command overrides the setting you select using the Set1755 program.

SPECIAL KEY COMBINATIONS

There are special key combinations, using the keys labeled in blue, that can help you to save battery power as you use your computer and let you quickly control other special features. These key combinations temporarily override the Setup program and Power program settings.

FN+F1 (Color)

This key combination lets you select from various colormaps when Max Contrast (in Set1755) is disabled. Choose the setting that is best suited to the software you are using.

Note: The colormap you select with this combination updates your computer's CMOS.

FN+ALT+F1 (Reverse)

If Max Contrast is enabled, this key combination switches between normal and reverse video.

Note: You must press these keys exactly in the sequence shown. Otherwise, the reverse function will not work properly.

FN+F2 (Video)

This key combination lets you switch between the computer's display panel and an external video display. You cannot use both displays at the same time.

Note: If no external monitor is connected, the LCD display still turns off when you press this key combination. Press it again to turn on the LCD display.

FN+F3 (Speed)	Press this key combination to select the computer's speed (20MHz or 10MHz). The power indicator lights orange when you select 10MHz.
FN+F4 (Disk)	This key combination causes the hard disk to spin down until accessed. No special keystrokes or commands are needed to turn on the hard disk again. The hard disk automatically starts when it is accessed.
FN+F5 (Spkr)	This key combination enables and disables the speaker.
FN+F7 (Display)	Press this key combination to turn off the backlight and the LCD. Any keyboard entry you make or any other video activity (including a blinking cursor) turns the backlight and the LCD back on. You cannot use this key combination to turn off an external video display.
FN+F8 (Serial)	This key combination enables and disables the serial ports. Each time you turn on the computer, the serial ports are automatically enabled. While the computer is on, press this key combination to toggle between disabling and enabling the ports.
FN+F10 (Standby)	This key combination puts the computer in a standby mode. The hard disk, LCD, backlight, and floppy disk controller are turned off until you make a keyboard entry or until any other video activity occurs (including a blinking cursor).

USING MS-DOS

ENTERING MS-DOS COMMANDS

MS-DOS is an operating system that manages your computer's operations and conveys your instructions to the computer. How much you need to know about the MS-DOS operating system depends on how you plan to use your computer. If you plan to use advanced operating system features or create your own applications, you need to become quite familiar with MS-DOS.

You type MS-DOS instructions, or *commands*, at the system prompt (`C:\>` or `A:\>`), which tells you that MS-DOS is ready to accept commands.

You must enter MS-DOS commands exactly as given. Your computer carries out MS-DOS commands exactly as you enter them. If you mistype a command, MS-DOS gives you an error message.

You can type your instructions to MS-DOS in either uppercase or lowercase letters. However, do not use substitute characters on the computer's keyboard as you might on a standard typewriter's keyboard. For example, do not type the letter O for the number 0, or the letter I for the number 1.

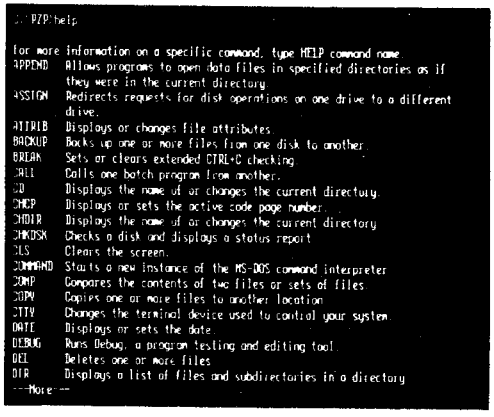
MS-DOS ON-LINE HELP

Your GRiD 1755 has an MS-DOS Help on-line utility that provides information about DOS commands. The Help utility provides information in two different forms — a summary of what each command does, and a more detailed listing of the syntax and options for each command.

To see the summary, type the following:

`help` **ENTER**

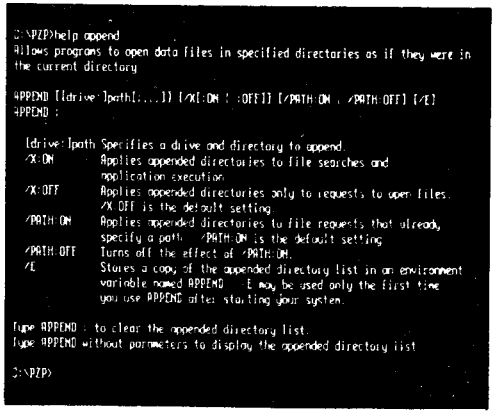
The first screen of general information appears. Press any key to display additional screens of information.



To display more detailed information about a particular command, type `help` plus the name of the command. For example, to see information about the APPEND command, type the following:

`help append` **ENTER**

This same detailed information is included in "MS-DOS Quick Reference" in this manual.

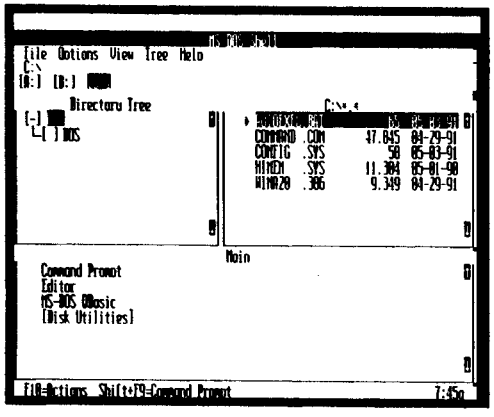


USING THE MS-DOS SHELL

The MS-DOS Shell is a graphics-oriented application included with MS-DOS that helps you run applications and use MS-DOS commands. You can choose from menus using either the keyboard or a mouse. Choosing an application or command is easy; you simply highlight the application or command name using the arrow keys or mouse, and press **ENTER.**

To run the MS-DOS shell, type the following:

`dosshell` **ENTER**



The MS-DOS shell's main screen appears.

Note: You can add this command to your autoexec.bat file if you want to load the shell every time you turn on your computer.

- Press the tab key to move from one of the screen's windows to another.
- Use the arrow keys to select items within a window.

For on-line help for the DOS shell, press **F10.** Then, select *Help* and press **ENTER.** Or, you can press **F1** for help information about the currently highlighted topic.

ABOUT THE DRIVES

The GRiD 1755 has an internal diskette drive and a hard disk drive. You can start the operating system and most application programs either from the hard disk or the diskette drive.

The hard disk drive is called Drive C and can store 60 million bytes (60 MB) or 80 million bytes (80 MB) of data. The hard disk can store much more information than a diskette, and it takes less time to find information on a hard disk than on a diskette.

When you store programs (such as MS-DOS) and other information on a hard disk, we recommend that you keep backup copies of the applications and data on diskettes. This prevents the loss of all your applications and data even if the hard disk is accidentally damaged.

The diskette drive is called Drive A, and uses 3 ½-inch 1.44MB diskettes (GRiD Cat. No. 103959-00). The diskette drive is usually used to copy files and to make backups of hard disk files. However, you can also use this drive to copy application programs to the hard disk.

BACKING UP YOUR HARD DISK

Making backups of hard disk files is extremely important. Because the storage capacity of a hard disk is so much greater, loss of data can result in the loss of thousands of hours of work.

You can use the BACKUP command to make copies of one or more directories or of the entire hard disk. For example, if you have a subdirectory named *Mystuff* in the root directory of your hard disk, you can use the BACKUP command to copy the subdirectory to a diskette. With a formatted diskette in Drive A, type:

```
backup c:\mystuff a: /s ENTER
```

Note: Unless you specify otherwise, using this method causes MS-DOS to erase any files currently on the diskette used for the hard disk backup. Be sure you use a newly formatted diskette or a diskette that contains files you do not want to keep.

To accomplish the same backup without erasing files currently on the diskette, add the /a switch to the command. The /a switch causes the BACKUP command to add the new files to any existing files on the diskette. In MS-DOS, a switch is always preceded by a slash (/) symbol. The same command with the /a switch is:

```
backup c:\mystuff a: /s/a ENTER
```

The /s switch, used in the previous command, instructs MS-DOS to back up all the files in a directory and all the directories and files that branch from that specified directory.

You can use the BACKUP command with the /s switch to back up the entire hard disk to diskettes. Before you use this command, use the FORMAT command to prepare enough diskettes to hold all the files you want to back up. To back up everything on Drive C, type:

```
backup c:\ a: /s ENTER
```

The backward slash (\) is an abbreviation for the root directory of any disk. This command line instructs MS-DOS to copy all files from the root directory of Drive C (the hard disk) to the diskette in drive A. Because all directories branch from the root directory, BACKUP copies all the files in all the disk directories. For more information on BACKUP and its switches, see the "MS-DOS Quick Reference" section in this manual.

RESTORING BACKUPS TO YOUR HARD DISK

Use the RESTORE command to copy one or more backed up directories from a diskette to the hard disk. Use RESTORE only for those directories that were copied to the diskette with the BACKUP command.

To restore the directory Mystuff from the diskette in Drive A back to the hard disk (Drive C), type:

```
restore a: c:\mystuff\*.* /s ENTER
```

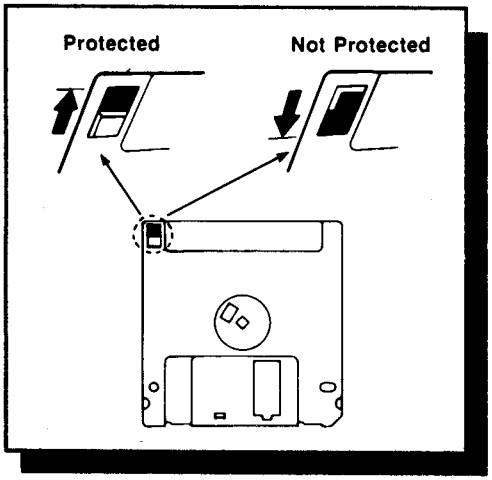
To restore all the files that were backed up from all directories of Drive C, insert the first backup diskette into Drive A and type:

```
restore a: c: /s ENTER
```

The /s switch instructs MS-DOS to copy all files and directories that were saved on diskettes with the BACKUP command. If the backup required more than one diskette, MS-DOS prompts you to change diskettes during the restore procedure.

For more information about RESTORE and its options, see the "MS-DOS Quick Reference" section in this manual.

Caution: The **Disk** indicator lights whenever the computer accesses the hard disk. Do not turn off the computer when the **Disk** indicator is on. The data on the hard disk could be lost or distorted.



WRITE PROTECTION

Diskettes have a special safety feature that protects recorded information from being altered. This special feature is a *write-protect window*.

To write-protect your diskette, open the write-protect window by sliding its cover.

To be able to edit and store information on your diskette, close the write-protect window.

Note: This write-protection feature does not prevent the information on the diskette from being lost from exposure to a magnetic field or a bulk diskette eraser.

HOW MS-DOS STORES INFORMATION

If you want to learn more about how your operating system works, you need to know how MS-DOS organizes and stores information.

About Files

Your computer stores all information on the diskette in *files*. A file is a collection of information. These are the main types of files:

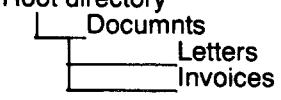
- **System files** contain operating system information that manages the computer's operations.
- **Application files** contain information that causes the computer to perform a task or set of tasks.
- **Data files** contain information you enter, such as the documents and spreadsheets you create with software.

About Directories

All files on a diskette reside in *directories*. A directory is simply a storage space for your files. When you format a diskette, you create one directory called the root directory. On your MS-DOS system diskette, the root directory contains all command and system files. When you start up your computer using MS-DOS, you are automatically in (operating from) the root directory.

You can create other directories using the *md* command. The new directory is a subdirectory of the directory you are in when you create the directory. For example, if you created a subdirectory named *Documnts*, it would reside in the root directory and your disk organization would look like this:

You can now store files in the Documnts subdirectory. If you change your current directory to the Documnts directory using the *cd* command, then make two more subdirectories called *Letters* and *Invoices*, your directory would look like:



In each subdirectory you can save files with related information. For example, save your correspondences in the Letters subdirectory of Documnts and save your invoices in the Invoices subdirectory of Documnts.

Your computer uses a shorter way of referring to subdirectories and files. The computer always refers to the root directory as \. Your computer refers to files and subdirectories of the root directory as that directory or file's name, preceded by \. In the above example, we would refer to the Documnts directory as \Documnts. To refer to the next level of subdirectory or a file in \Documnts, add a \, then the name of the file or subdirectory. For example, your reference is \Documnts\Letters.

You should not store files in the root directory because they can be easily overwritten by many application programs, which have a tendency to name their overlays the same as previously saved versions. The root directory also has a limit to the number of files it can hold. To ensure that your files are in order and safe from being overwritten, we suggest you make directories for your work, using the *md* command.

About Filenames

Following is a complete list of acceptable characters for filenames:

- Uppercase letters A through Z
- Lowercase letters a through z
- Decimal digits 0-9
- Symbols $ & # % ' ( ) @ – { } ! _ ~'

When you create filenames and subdirectory names, do not use more than eight characters. MS-DOS ignores any characters after the eighth. For example, MS-DOS regards both *Accounts1* and *Accounts2* as *Accounts*. If you save both files, MS-DOS writes over the first file with the second, destroying the first file. Also, MS-DOS does not distinguish between upper and lowercase letters.

Other than the ones listed above, you cannot use symbols in filenames. There are also a few special words (MS-DOS device names) you cannot use. These are:

aux	com1	com2	com3
con	lpt1	lpt2	com4
lpt3	nul	prn	Clock$

Filename Extensions

Any filename or directory can contain an *extension*, which further identifies the file. An extension appears at the end of a filename, preceded by a period.

Note: Directory extensions are not normally used because they can appear as a filename to an unknowing user.

Extensions can have up to three characters and can include the same characters allowed in filenames. If you try to give extensions more than three characters, MS-DOS uses only the first three.

If you include an extension in a filename, you must use that extension whenever you specify the file.

Note: Some applications automatically assign an extension to your filename.

Examples of valid filenames are:

mydata1	SAMPLE
1.TST	$100GIFT
records.art	'HELP'.fil
XXX.XX	File#1.txt
10%SALES	par@64.gam
PROG1.BAS	Check.bal
PROG2.bas	myprog.sor

Examples of invalid filenames are:

his*hers — The asterisk is not a valid character for filenames.

.DATA — The period is valid in a filename only when separating the filename from its extension.

regionsales — Filenames have a maximum of eight characters. MS-DOS uses only the first eight characters of the filename (regionsa).

COST+INT — The plus symbol is not a valid character for filenames.

CON.dat — CON is a word reserved by MS-DOS.

MORE ABOUT MS-DOS COMMANDS AND KEYS

The MS-DOS operating system includes both internal and external commands. MS-DOS stores its internal commands in memory when you start up your computer. Internal commands remain in memory at all times. These commands execute immediately when you enter them. COPY and DIR are examples of internal MS-DOS commands.

External MS-DOS commands are stored on the hard drive or diskettes as program files. When you enter an external command, MS-DOS searches for the command on the diskette and, if the command is found, executes it. Because all MS-DOS commands are stored on the GRiD 1755's hard drive, you do not have to insert a diskette to access these external commands.

Typing Commands

You can enter a command whenever the screen displays the system prompt.

A command consists of one word — the *command name*. A *command line* consists of one or more command names and their associated parameters and switches.

Parameters and *switches* are special information you include with a command. They provide information to the command, or they determine how the command operates.

A command line can have a maximum of 127 characters, including any combination of uppercase or lowercase letters. To execute a command line, press **ENTER**. For example, to clear the screen, type:

```
cls ENTER
```

Editing Commands

MS-DOS tries to carry out the commands you type. If you type an invalid command, MS-DOS gives you an error message. If you make a typing mistake, but the resulting command is valid, MS-DOS carries out the command as you entered it.

If you notice a typing mistake before you press **ENTER**, you have two choices:

- Backspace to the mistake, and retype to the end of the line.
- Press **ESC** to exit the line you are typing and retype ythe command.

If you use **ESC** to end a line, the system prompt does not reappear. Type the command line and press **ENTER** to execute it.

Special Keys

The following keys and key combinations have special significance to MS-DOS.

SPACE BAR — Moves the cursor (the flashing underline or block character displayed on the screen) one space to the right and adds a space to a line.

CTRL — Lets you give commands to your computer by pressing only two or three keys. Press and hold down **CTRL**. Then, while you hold down **CTRL**, press the other keys.

BACKSPACE — Moves the cursor left one character and erases the character in that position.

CTRL+C or **CTRL+BREAK** — Stops the execution of an MS-DOS command or an application that uses MS-DOS functions. If the application does not access MS-DOS, the application does not recognize this key combination. (The computer might take a few seconds to recognize the key combination.)

CTRL+PRTSC or **CTRL+P** — Sends each character of output to the printer. Press the combination again to stop print echo.

PRTSC — Sends the current display to the printer.

ESC — Terminates the current line without processing it and performs a carriage return and line feed. (The cursor moves down one line and returns to the left margin.) Although the system prompt does not appear, the system is ready for a command.

ENTER — Executes a command and begins processing the command line you type. Pressing **ENTER** also causes a carriage return and line feed. (The cursor moves down one line and returns to the left margin.)

CTRL+J — Ends the current line, and moves the cursor to the next line without processing the line. Press **ENTER** to execute the command line when it is complete.

CTRL+ALT+DEL — Resets your computer the same as if you had turned it off and then on again.

CTRL+S or **PAUSE** — Stops scrolling information on the screen to let you view it. Press any key to resume scrolling.

MS-DOS provides several key combinations to help you edit an MS-DOS command line. These keys act on the command line in the last-command memory, or template. Press **F3** to display the template. You can execute the command line again by pressing **ENTER**, or you can use the following keys to edit the command line in the template.

ENTER — Enter line. Makes the new line the new template and executes the command line.

ESC — Void line. Voids the new line but does not affect the template.

INS — Insert character. Goes into the insert mode so that you can insert characters into the template. Press **F3** to end the insert function.

DEL — Delete character. Erases the next character from the template. The character is skipped and is not copied to the command line.

F1 — Copy character. Copies the next character from the template and displays it on the command line.

F2 (*character*) — Copy to character. Copies all characters in the template up to the specified character and displays the characters on the command line.

F3 — Display template. Redisplays the entire template.

F4 (*character*) — Delete to character. Deletes all characters up to the character indicated. These characters are skipped and not copied to the command line.

F5 — Replace template. Makes the line you type the new template but does not execute the command.

F6 or **CTRL+Z** — End-of-file. Puts an end-of-file marker in the template.

Special Commands

You have learned several commands that help you set up and use your computer. There are also many other commands available. This section contains information about some of the most helpful commands. Learning these commands makes it easy for you to look up other commands and functions in the *MS-DOS Reference Manual*.

Viewing a Directory

To look at the directory (a list of files) of a diskette, use the DIR command. For example, to view the contents of the diskette in the current drive, type:

```
dir ENTER
```

If a diskette contains more filenames than can appear on the screen at one time, all but the last 22 filenames scroll off the top of the screen. MS-DOS has three ways to help you avoid this problem:

- Press **CTRL+S** to stop the screen from scrolling. (Press any key to restart the scrolling.)
- Use the /P switch with the DIR command. The /P switch tells MS-DOS to display only 23 lines of the directory at one time. Press the space bar to display another screen. To use the /P switch, type:

  ```
  dir /p ENTER
  ```

- Use the /W switch to display the files in five columns. This format usually allows all of the filenames to appear on the screen at once. The format for this command line is:

  ```
  dir /w ENTER
  ```

Looking Inside Files

TYPE is a command that lets you examine files that consist of text characters. For instance, to view the joe.sls file, type:

```
type joe.sls ENTER
```

The file contents appear on the screen. If there are too many lines in the file to fit on the screen, use **CTRL+S** or **CTRL+PAUSE** to stop the screen from scrolling. Press any key to resume scrolling.

If you use TYPE to display a file that is not a text file, it displays meaningless data.

USING OTHER COMMANDS

MS-DOS has more than 50 commands and functions. The guidelines you learned in this manual provide the background you need to use MS-DOS's many capabilities.

By referring to the *MS-DOS Reference Manual*, sold separately, you can learn how to create and edit data files, create command files to accomplish numerous tasks in sequence, create directories, send information to your printer, and much more.

MS-DOS QUICK REFERENCE

ASSIGN

Redirects requests for disk operations on one drive to a different drive.

Assign [*x*[:]=*y*[:][...]]

Assign /status

x Specifies the drive letter to reassign.

y Specifies the drive that *x*: will be assigned to.

/STATUS Displays current drive assignments.

Type ASSIGN without parameters to reset all drive letters to original assignments.

ATTRIB

Displays or changes file attributes.

Attrib [**+R** | **-R**] [**+A** | **-A**] [**+S** | **-S**] [**+H** | **-H**] [[*drive*:][*path*]*filename*] [**/S**]

+ Sets an attribute.

- Clears an attribute.

R Read-only file attribute.

A Archive file attribute.

S System file attribute.

H Hidden file attribute.

/S Processes files in all directories in the specified path.

BACKUP

Backs up one or more files from one disk to another.

Backup *source destination-drive:* [**/S**] [**/M**] [**/A**] [**/F**[:*size*]] [**/D**:*date*[**/T**:*time*]] [**/L**[:[*drive*:][*path*]*logfile*]]

source Specifies the file(s), drive, or directory to back up.

destination-drive: Specifies the drive to save backup copies onto.

/S Backs up contents of subdirectories.

/M Backs up only files that have changed since the last backup.

/A Adds backup files to an existing backup disk.

/F:[*size*] Specifies the size of the disk to be formatted.

/D:*date* Backs up only files changed on or after the specified date.

/T:*time* Backs up only files changed at or after the specified time.

/L[:[*drive*:][*path*]*logfile*] Creates a log file and entry to record the backup operation.

BREAK

Break [**ON** | **OFF**]

Type BREAK without a parameter to display the current BREAK setting.

CALL

Calls one batch program from another.

Call [*drive*:][*path*]*filename* [*batch-parameters*]

batch-parameters Specifies any command-line information required by the batch program.

CD

Cd [*drive*:][*path*]

Cd[..].. Specifies that you want to change to the parent directory.

Type CD *drive*: to display the current directory in the specified drive.

Type CD without parameters to display the current drive and directory.

CHCP

Displays or sets the active code page number.

Chcp [*nnn*]

nnn Specifies a code page number.

Type CHCP without a parameter to display the active code page number.

CHDIR

Displays the name of or changes the current directory.

Chdir [*drive*:][*path*]

Chdir[..]

CHKDSK

Checks a disk and displays a status report.

Chkdsk [*drive*:][[*path*]*filename*] [**/F**] [**/V**]

[*drive*:][*path*] Specifies the drive and directory to check.

filename Specifies the file(s) to check for fragmentation.

/F Fixes errors on the disk.

/V Displays the full path and name of every file on the disk.

Type CHKDSK without parameters to check the current disk.

CLS

Clears the screen.

Cls

COMMAND

Starts a new instance of the MS-DOS command interpreter.

Command [[*drive*:]*path*] [*device*] [**/E:***nnnnn*] [**/P**] [**/C** *string*] [**/MSG**]

[*drive*:]*path* Specifies the directory containing Command.com file.

device Specifies the device to use for command input and output.

/E:*nnnnn* Sets the initial environment size to *nnnnn* bytes.

/P Makes the new command interpreter permanent (can't exit).

/C *string* Carries out the command specified by string, and then stops.

/MSG Specifies that all error messages be stored in memory. You need to specify /P with this switch.

COMP

Compares the contents of two files or sets of files.

COMP [*data1*] [*data2*] [**/D**] [**/A**] [**/L**] [**/N=***number*] [**/C**]

data1 Specifies location and name(s) of first file(s) to compare.

data2 Specifies location and name(s) of second files to compare.

/D Displays differences in decimal format. This is the default setting.

/A Displays differences in ASCII characters.

/L Displays line numbers for differences.

/N=*number* Compares only the first specified number of lines in each file.

/C Disregards case of ASCII letters when comparing files.

To compare sets of files, use wildcards in *data1* and *data2* parameters.

COPY

Copies one or more files to another location.

Copy [**/A** | **/B**] *source* [**/A** | **/B**] [+ *source* [**/A** | **/B**] [+ ...]] [*destination* [**/A** | **/B**]] [**/V**]

source Specifies the file or files to be copied.

/A Indicates an ASCII text file.

/B Indicates a binary file.

destination Specifies the directory and/or filename for the new file(s).

/V Verifies that new files are written correctly.

To append files, specify a single file for *destination*, but multiple files for *source* (using wildcards or file1+file2+file3 format).

CTTY

Changes the terminal device used to control your system.

Ctty *device*

device The terminal device you want to use, such as COM1.

DATE

Displays or sets the date.

Date [*date*]

Type DATE without parameters to display the current date setting and a prompt for a new one.Press ENTER to keep the same date.

DEBUG

Runs Debug, a program testing and editing tool.

Debug [[*drive:*][*path*]*filename* [*testfile-parameters*]]

[*drive:*][*path*]*filename* Specifies the file you want to test.

testfile-parameters Specifies command-line information required by the file you want to test.

After Debug starts, type ? to display a list of debugging commands.

DEL

Deletes one or more files.

Del [*drive:*][*path*]*filename* [**/P**]

Erase [*drive:*][*path*]*filename* [**/P**]

[*drive:*][*path*]*filename* Specifies the file(s) to delete.Specify multiple files by using wildcards.

/P Prompts for confirmation before deleting each file.

DISKCOMP

Compares the contents of two floppy disks.

Diskcomp [*drive1*: [*drive2:*]] [**/1**] [**/8**]

/1 Compares the first side of the disks.

/8 Compares only the first eight sectors of each track.

DISKCOPY

Copies the contents of one floppy disk to another.

Diskcopy [*drive1*: [*drive2:*]] [**/1**] [**/V**]

/1 Copies only the first side of the disk.

/V Verifies that the information is copied correctly.

The two floppy disks must be the same type.

You may specify the same drive for *drive1* and *drive2*.

DIR

Displays a list of files and subdirectories in a directory.

Dir [*drive*:][*path*][*filename*] [/**P**] [/**W**] [/**A**[[:]*attributes*]] [/**O**[[:]*sortorder*]] [/**S**] [/**B**] [/**L**]

[*drive*:][*path*][*filename*] Specifies drive, directory, and/or files to list.

/**P** Pauses after each screenful of information.

/**W** Uses wide list format.

/**A** Displays files with specified attributes.

attributes **D** Directories **R** Read-only files

H Hidden files **A** Files ready for archiving

S System files - Prefix meaning "not"

/**O** List by files in sorted order.

sortorder **N** By name (alphabetic) **S** By size (smallest first)

E By extension (alphabetic) **D** By date & time (earliest first)

G Group directories first-Prefix to reverse order

/**S** Displays files in specified directory and all subdirectories.

/**B** Uses bare format (no heading information or summary).

/**L** Uses lowercase.

Switches may be preset in the DIRCMD environment variable. Override preset switches by prefixing any switch with - (hyphen) — for example, /-W.

ECHO

Displays messages, or turns command-echoing on or off.

Echo [**ON** | **OFF**]

Echo [*message*]

Type ECHO without parameters to display the current echo setting.

EDIT

Starts the MS-DOS Editor, which creates and changes ASCII files.

Edit [[*drive*:][*path*]*filename*] [/**B**] [/**G**] [/**H**] [/**NOHI**]

[*drive*:][*path*]*filename* Specifies the ASCII file to edit.

/**B** Allows use of a monochrome monitor with a color graphics card.

/**G** Provides the fastest update of a CGA screen.

/H Displays the maximum number of lines possible for your hardware.

/NOHI Allows the use of a monitor without high-intensity support.

EDLIN

Starts Edlin, a line-oriented text editor.

EDLIN [*drive*:][*path*]*filename* [**/B**]

/B Ignores end-of-file (CTRL+Z) characters.

EMM386

Turns on or off EMM386 expanded memory support.

Emm386 [ON | OFF | AUTO] [W=ON | W=OFF]

ON | OFF | AUTO Activates or suspends EMM386.EXE device driver, or places it in auto mode.

W=ON | OFF Turns on or off Weitek coprocessor support.

ERASE

Deletes one or more files.

Del [*drive*:][*path*]*filename* [**/P**]

Erase [*drive*:][*path*]*filename* [**/P**]

[*drive*:][*path*]*filename* Specifies the file(s) to delete. Specify multiple files by using wildcards.

/P Prompts for confirmation before deleting each file.

EXE2BIN

Converts .EXE (executable) files to binary format.

Exe2bin [*drive1*:][*path1*]*input-file* [[*drive2*:][*path2*]*output-file*]

input-file Specifies the .EXE file to be converted.

output-file Specifies the binary file to be created.

EXIT

Quits the COMMAND.COM program (command interpreter).

Exit

EXPAND

Expands one or more compressed files.

Expand [*drive*:][*path*]*filename* [[*drive1*:][*path1*]*filename*[...]] *destination*

[*drive*:][*path*]*filename* Specifies the location and/or name of a file or set of files to be expanded. You cannot use wildcards.

destination Specifies the new location and/or name of an expanded file or set of files.

Destination can be a drive letter and colon, directory name, filename, or combination. The destination can only be a filename if you have specified a single filename for the source filename parameter. To expand multiple files to a different directory and keep the original filenames, specify only a directory as the destination.

FASTOPEN

Decreases the amount of time needed to open frequently used files and directories.

Fastopen *drive*:[[=]**n**] [*drive*:[[=]**n**][...]] [**/X**]

drive: Specifies the hard disk drive you want Fastopen to work with.

n Specifies the maximum number of file locations Fastopen retains in its filename cache.

/X Creates the filename cache in expanded memory.

FC

Compares two files or sets of files and displays the differences between them.

Fc [**/A**] [**/C**] [**/L**] [**/LB***n*] [**/N**] [**/T**] [**/W**] [*/nnnn*]
[*drive1*:][*path1*]*filename1*
[*drive2*:][*path2*]*filename2*

Fc /B [*drive1*:][*path1*]*filename1* [*drive2*:][*path2*]*filename2*

/A Displays only first and last lines for each set of differences.

/B Performs a binary comparison.

/C Disregards the case of letters.

/L Compares files as ASCII text.

/LB*n* Sets the maximum consecutive mismatches to the specified number of lines.

/N Displays the line numbers on an ASCII comparison.

/T Does not expand tabs to spaces.

/W Compresses white space (tabs and spaces) for comparison.

/nnnn Specifies the number of consecutive lines that must match after a mismatch.

FDISK

Configures a hard disk for use with MS-DOS.

Fdisk

FIND

Searches for a text string in a file or files.

Find [**/V**] [**/C**] [**/N**] [**/I**] "*string*" [[*drive*:][*path*]*filename*[...]]

/V Displays all lines NOT containing the specified string.

/C Displays only the count of lines containing the string.

/N Displays line numbers with the displayed lines.

/I Ignores the case of characters when searching for the string.

"*string*" Specifies the text string to find.

[*drive*:][*path*]*filename* Specifies a file or files to search.

If a pathname is not specified, FIND searches the text typed at the prompt or piped from another command.

FOR

Runs a specified command for each file in a set of files.

For %*variable* **IN** (*set*) **DO** *command* [*command-parameters*]

%*variable* Specifies a replaceable parameter.

(*set*) Specifies a set of one or more files. Wildcards may be used.

command Specifies the command to carry out for each file.

command-parameters Specifies parameters or switches for the specified command.

To use the FOR command in a batch program, specify %%*variable* instead of %*variable*.

FORMAT

Formats a disk for use with MS-DOS.

Format *drive*: [**/V**[:*label*]] [**/Q**] [**/U**] [**/F**:*size*] [**/B** | **/S**]

Format *drive*: [**/V**[:*label*]] [**/Q**] [**/U**] [**/T:***tracks* **/N:***sectors*] [**/B** | **/S**]

Format *drive*: [**/V**[:*label*]] [**/Q**] [**/U**] [**/1**] [**/4**] [**/B** | **/S**]

Format *drive*: [**/Q**] [**/U**] [**/1**] [**/4**] [**/8**] [**/B** | **/S**]

/V[:*label*] Specifies the volume label.

/Q Performs a quick format.

/U Performs an unconditional format.

/F:*size* Specifies the size of the floppy disk to format (such as 160, 180, 320, 360, 720, 1.2, 1.44, 2.88).

/B Allocates space on the formatted disk for system files.

/S Copies system files to the formatted disk.

/T:*tracks* Specifies the number of tracks per disk side.

/N:*sectors* Specifies the number of sectors per track.

/1 Formats a single side of a floppy disk.

/4 Formats a 5.25-inch 360K floppy disk in a high-density drive.

/8 Formats eight sectors per track.

GOTO

Directs MS-DOS to a labeled line in a batch program.

Goto *label*

label Specifies a text string used in the batch program as a label.

You type a label on a line by itself, beginning with a colon.

GRAFTABL

Enables MS-DOS to display an extended character set in graphics mode.

Graftabl [*xxx*]

Graftabl /STATUS

xxx Specifies a code page number.

/STATUS Displays the current code page selected for use with GRAFTABL.

GRAPHICS

Loads a program that can print graphics.

Graphics [*type*] [[*drive*:][*path*]*filename*] [**/R**] [**/B**] [**/LCD**] [**/PRINTBOX:STD** | **/PRINTBOX:LCD**]

type Specifies a printer type (see *User's Guide and Reference*).

[*drive*:][*path*]*filename* Specifies the file containing information on supported printers.

/R Prints white on black as seen on the screen.

/B Prints the background in color for COLOR4 and COLOR8 printers.

/LCD Prints using LCD aspect ratio.

/PRINTBOX:STD | **/PRINTBOX:LCD** Specifies the print-box size, either STD or LCD.

HELP

Provides help information for MS-DOS commands.

Help [*command*]

command Displays help information on that command.

IF

Performs conditional processing in batch programs.

If [NOT] ERRORLEVEL *number command*

If [NOT] *string1*==*string2 command*

If [NOT] EXIST *filename command*

NOT Specifies that MS-DOS should carry out the command only if the condition is false.

ERRORLEVEL *number* Specifies a true condition if the last program run returned an exit code equal to or greater than the number specified.

command Specifies the command to carry out if the condition is met.

string1==*string2* Specifies a true condition if the specified text strings match.

EXIST *filename* Specifies a true condition if the specified filename exists.

JOIN

Joins a disk drive to a directory on another drive.

Join [*drive1*: [*drive2*:]*path*]

Join *drive1*: **/D**

drive1: Specifies a disk drive that will appear as a directory on *drive2*.

drive2: Specifies a drive to which you want to join *drive1*.

path Specifies the directory to which you want to join *drive1*. It must be empty and cannot be the root directory.

/D Cancels any previous JOIN commands for the specified drive.

Type JOIN without parameters to list currently joined drives.

KEYB

Configures a keyboard for a specific language.

Keyb [*xx*[,[*yyy*][,[*drive*:][*path*]*filename*]]] [**/E**] [**/ID:***nnn*]

xx Specifies a two-letter keyboard code.

yyy Specifies the code page for the character set.

[*drive*:][*path*]*filename* Specifies the keyboard definition file.

/E Specifies that an enhanced keyboard is installed.

/ID:*nnn* Specifies the keyboard in use.

LABEL

Creates, changes, or deletes the volume label of a disk.

Label [*drive*:][*label*]

LOADFIX

Loads a program above the first 64K of memory, and runs the program.

Loadfix [*drive*:][*path*]*filename*

Use LOADFIX to load a program if you have received the message "Packed file corrupt" when trying to load the program in low memory.

LOADHIGH

Loads a program into the upper memory area.

Loadhigh [*drive*:][*path*]*filename* [*parameters*]

Lh [*drive*:][*path*]*filename* [*parameters*]

parameters Specifies any command-line information required by the program you want to load.

MD

Creates a directory.

Mkdir [*drive*:]*path*

Md [*drive*:]*path*

MEM

Displays the amount of used and free memory in your system.

Mem [**/PROGRAM** | **/DEBUG** | **/CLASSIFY**]

/PROGRAM or **/P** Displays status of programs currently loaded in memory.

/DEBUG or **/D** Displays status of programs, internal drivers, and other information.

/CLASSIFY or **/C** Classifies programs by memory usage. Lists the size of programs, provides a summary of memory in use, and lists largest memory block available.

MIRROR

Records information about one or more disks.

Mirror [*drive*:[...]] [**/1**] [**/T***drive*[*-entries*][...]]

Mirror [**/U**]

Mirror [**/PARTN**]

drive: Specifies the drive for which you want to save information.

/1 Saves only the latest disk information (does not back up previous information).

/T*drive* Loads the deletion-tracking program for the specified drive.

-entries Specifies maximum number of entries in the deletion-tracking file.

/U Unloads the deletion-tracking program.

/PARTN Saves hard disk partition information to a floppy disk.

MKDIR

Creates a directory.

Mkdir [*drive*:]*path*

Md [*drive*:]*path*

MODE

Configures system devices.

Printer Port

MODE LPT*n*[:] [**COLS**=*c*] [**LINES**=*l*] [**RETRY**=*r*]

Serial Port

MODE COM*m*[:] [**BAUD**=*b*] [**PARITY**=*p*] [**DATA**=*d*] [**STOP**=*s*] [**RETRY**=*r*]

Device Status

MODE [*device*] [/**STATUS**]

Redirect Printing

MODE LPT*n*[:]=**COM***m*[:]

Prepare Code Page

MODE *device* **CP PREPARE**=((*yyy*[...]) [*drive*:][*path*]*filename*)

Select Code Page

MODE *device* **CP SELECT**=*yyy*

Refresh Code Page

MODE *device* **CP REFRESH**

Code Page Status

MODE *device* **CP** [/**STATUS**]

Display Mode

MODE [*display-adapter*][,*n*]

MODE CON[:] [**COLS**=*c*] [**LINES**=*n*]

Typematic Rate

MODE CON[:] [**RATE**=*r* **DELAY**=*d*]

MORE

Displays output one screen at a time.

More [*drive*:][*path*]*filename command-name* | **MORE**

[*drive*:][*path*]*filename* Specifies a file to display one screen at a time.

command-name Specifies a command whose output will be displayed.

NLSFUNC

Loads country-specific information.

Nlsfunc [[*drive*:][*path*]*filename*]

[*drive*:][*path*]*filename* Specifies the file containing country-specific information.

PATH

Displays or sets a search path for executable files.

Path [[*drive*:]*path*[;...]]

Path ;

Type PATH ; to clear all search-path settings and direct MS-DOS to search only in the current directory.

Type PATH without parameters to display the current path.

PAUSE

Suspends processing of a batch program and displays the message "Press any key to continue...."

Pause

PRINT

Prints a text file while you are using other MS-DOS commands.

Print [/**D**:*device*] [/**B**:*size*] [/**U**:*ticks1*] [/**M**:*ticks2*] [/**S**:*ticks3*] [/**Q**:*qsize*] [/**T**] [[*drive*:][*path*]*filename*[...]] [/**C**] [/**P**]

/**D**:*device* Specifies a print device.

/**B**:*size* Sets the internal buffer size, in bytes.

/**U**:*ticks1* Waits the specified maximum number of clock ticks for the printer to be available.

/**M**:*ticks2* Specifies the maximum number of clock ticks it takes to print a character.

/**S**:*ticks3* Allocates the scheduler the specified number of clock ticks for background printing.

/**Q**:*qsize* Specifies the maximum number of files allowed in the print queue.

/**T** Removes all files from the print queue.

/**C** Cancels printing of the preceding filename and subsequent filenames.

/**P** Adds the preceding filename and subsequent filenames to the print queue.

Type PRINT without parameters to display the contents of the print queue.

PROMPT

Changes the MS-DOS command prompt.

Prompt [*text*]

text Specifies a new command prompt.

Prompt can be made up of normal characters and the following special codes:

$Q = (equal sign)

$$ $ (dollar sign)

$T Current time

$D Current date

$P Current drive and path

$V MS-DOS version number

$N Current drive

$G (greater-than sign)

$L (less-than sign)

$B | (pipe)

$H Backspace (erases previous character)

$E Escape code (ASCII code 27)

$_ Carriage return and linefeed

Type PROMPT without parameters to reset the prompt to the default setting.

QBASIC

Starts the MS-DOS QBasic programming environment.

Qbasic [**/B**] [**/EDITOR**] [**/G**] [**/H**] [**/MBF**] [**/NOHI**] [[**/RUN**] [*drive*:][*path*]*filename*]

/B Allows use of a monochrome monitor with a color graphics card.

/EDITOR Starts the MS-DOS Editor.

/G Provides the fastest update of a CGA screen.

/H Displays the maximum number of lines possible for your hardware.

/MBF Converts the built-in functions MKS$, MKD$, CVS, and CVD to MKSMBF$, MKDMBF$, CVSMBF, and CVDMBF, respectively.

/NOHI Allows the use of a monitor without high-intensity support.

/RUN Runs the specified Basic program before displaying it.

[[*drive*:][*path*]*filename*] Specifies the program file to load or run.

RD

Removes (deletes) a directory.

Rmdir [*drive*:]*path*

Rd [*drive*:]*path*

RECOVER

Recovers readable information from a bad or defective disk.

Recover [*drive*:][*path*]*filename*

Recover *drive*:

Consult your *User's Guide and Reference* before using the RECOVER command.

REM

Records comments (remarks) in a batch file or CONFIG.SYS.

Rem [*comment*]

RENAME

Renames a file or files.

Rename [*drive*:][*path*]*filename1 filename2*

Ren [*drive*:][*path*]*filename1 filename2*

Note that you cannot specify a new drive or path for your destination file.

REPLACE

Replaces files.

Replace [*drive1*:][*path1*]*filename* [*drive2*:][*path2*] **[/A] [/P] [/R] [/W]**

Replace [*drive1*:][*path1*]*filename* [*drive2*:][*path2*] **[/P] [/R] [/S] [/W] [/U]**

[*drive1*:][*path1*]*filename* Specifies the source file or files.

[*drive2*:][*path2*] Specifies the directory where files are to be replaced.

/A Adds new files to destination directory. Cannot use with /S or /U switches.

/P Prompts for confirmation before replacing a file or adding a source file.

/R Replaces read-only files as well as unprotected files.

/S Replaces files in all subdirectories of the destination directory. Cannot use with the **/A** switch.

/W Waits for you to insert a disk before beginning.

/U Replaces (updates) only files that are older than source files. Cannot use with the **/A** switch.

RESTORE

Restores files that were backed up by using the BACKUP command.

Restore *drive1*: *drive2*:[*path*[*filename*]] [**/S**] [**/P**] [**/B**:*date*] [**/A**:*date*] [**/E**:*time*] [**/L**:*time*] [**/M**] [**/N**] [**/D**]

drive1: Specifies the drive on which the backup files are stored.

drive2:[*path*[*filename*]] Specifies the file(s) to restore.

/S Restores files in all subdirectories in the path.

/P Prompts before restoring read-only files or files changed since the last backup (if appropriate attributes are set).

/B Restores only files last changed on or before the specified date.

/A Restores only files changed on or after the specified date.

/E Restores only files last changed at or earlier than the specified time.

/L Restores only files changed at or later than the specified time.

/M Restores only files changed since the last backup.

/N Restores only files that no longer exist on the destination disk.

/D Displays files on the backup disk that match specifications.

RMDIR

Removes (deletes) a directory.

Rmdir [*drive*:]*path*

Rd [*drive:*]*path*

SET

Displays, sets, or removes MS-DOS environment variables.

Set [*variable*=[*string*]]

variable Specifies the environment-variable name.

string Specifies a series of characters to assign to the variable.

Type SET without parameters to display the current environment variables.

SETVER

Sets the version number that MS-DOS reports to a program.

Display Current Version Table

Setver [*drive:path*]

Add Entry

Setver [*drive:path*] *filename n.nn*

Delete Entry

Setver [*drive:path*] *filename* /**DELETE** [/**QUIET**]

[*drive:path*] Specifies location of the SETVER.EXE file.

filename Specifies the filename of the program.

n.nn Specifies the MS-DOS version to be reported to the program.

/**DELETE** or /**D** Deletes the version-table entry for the specified program.

/**QUIET** Hides the message typically displayed during deletion of version-table entry.

SHARE

Installs file-sharing and locking capabilities on your hard disk.

Share [/**F:***space*] [/**L:***locks*]

/**F:***space* Allocates file space (in bytes) for file-sharing information.

/**L:***locks* Sets the number of files that can be locked at one time.

SHIFT

Changes the position of replaceable parameters in a batch file.

Shift

SORT

Sorts input and writes results to the screen, a file, or another device.

Sort [/**R**] [/+*n*] [*drive1*:][*path1*]*filename1* [[*drive2*:][*path2*]*filename2*]

[*command* |] **Sort** [/**R**] [/+*n*] [[*drive2*:][*path2*]*filename2*]

/R Reverses the sort order; that is, sorts Z to A, then 9 to 0.

/+*n* Sorts the file according to characters in column *n*.

[*drive1*:][*path1*]*filename1* Specifies a file to be sorted.

[*drive2*:][*path2*]*filename2* Specifies a file where the sorted input is to be stored.

command Specifies a command whose output is to be sorted.

SUBST

Associates a path with a drive letter.

Subst [*drive1*: [*drive2:*]*path*]

Subst *drive1*: /**D**

drive1: Specifies a virtual drive to which you want to assign a path.

[*drive2*:]*path* Specifies a physical drive and path you want to assign to a virtual drive.

/D Deletes a substituted (virtual) drive.

Type SUBST with no parameters to display a list of current virtual drives.

SYS

Copies MS-DOS system files and command interpreter to a disk you specify.

Sys [*drive1*:][*path*] *drive2:*

[*drive1*:][*path*] Specifies the location of the system files.

drive2: Specifies the drive the files are to be copied to.

TIME

Displays or sets the system time.

Time [*time*]

Type TIME with no parameters to display the current time setting and a prompt for a new one.Press ENTER to keep the same time.

TREE

Graphically displays the directory structure of a drive or path.

Tree [*drive*:][*path*] [/**F**] [/**A**]

/**F** Displays the names of the files in each directory.

/**A** Uses ASCII instead of extended characters.

TYPE

Displays the contents of a text file.

Type [*drive*:][*path*]*filename*

UNDELETE

Restores files which have been deleted.

Undelete [[*drive*:][*path*]][*filename*] [/**LIST** | /**ALL**] [/**DT** | /**DOS**]

/**LIST** Lists the deleted files available to be recovered.

/**ALL** Undeletes all specified files without prompting.

/**DT** Uses only the deletion-tracking file.

/**DOS** Uses only the MS-DOS directory.

UNFORMAT

Restores a disk erased by the FORMAT command or restructured by the RECOVER command.

Unformat *drive*: [/**J**]

Unformat *drive*: [/**U**] [/**L**] [/**TEST**] [/**P**]

Unformat /PARTN [/**L**]

drive: Specifies the drive to unformat.

/**J** Verifies that the mirror files agree with the system information on the disk.

/**U** Unformats without using MIRROR files.

/**L** Lists all file and directory names found, or, when used with the /PARTN switch, displays current partition tables.

/TEST Displays information but does not write changes to disk.

/P Sends output messages to printer connected to LPT1.

/PARTN Restores disk partition tables.

VER

Displays the MS-DOS version.

VERIFY

Tells MS-DOS whether to verify that your files are written correctly to a disk.

Verify [ON | OFF]

Type VERIFY without a parameter to display the current VERIFY setting.

VOL

Displays the disk volume label and serial number, if they exist.

Vol [*drive*:]

XCOPY

Copies files (except hidden and system files) and directory trees.

Xcopy *source* [*destination*] [**/A** | **/M**] [**/D:***date*] [**/P**] [**/S** [**/E**]] [**/V**] [**/W**]

source Specifies the file(s) to copy.

destination Specifies the location and/or name of new files.

/A Copies files with the archive attribute set, doesn't change the attribute.

/M Copies files with the archive attribute set, turns off the archive attribute.

/D:*date* Copies files changed on or after the specified date.

/P Prompts you before creating each destination file.

/S Copies directories and subdirectories except empty ones.

/E Copies any subdirectories, even if empty.

/V Verifies each new file.

/W Prompts you to press a key before copying.

APPENDIX A - INTERNAL MODEM

INTRODUCTION

Your 2400-bps V.42 bis/FAX internal modem is a full-featured, Hayes-compatible modem that is custom designed to take full advantage of your laptop computer. In addition to standard high-speed operation, it features Microcom Networking Protocol classes 1-5 for error detection, correction, and data compression. The modem also supports CCITT V.42 and V.42 bis data compression. You can add optional fax software to use the modem to send and receive facsimile transmissions with your computer. Take a few minutes to read this section, and familiarize yourself with your modem and its many uses.

Your modem is a valuable tool that can save you time and money when you need to send or receive vital information. You do not have to be a computer whiz to use your modem. Communications software handles all of the commands for your modem.

Your modem's features include:

Hayes Compatibility — lets you use a wide variety of software to automatically control your modem's settings.

High Speed — so you can send and receive information at up to an effective 9600 bps.

Direct Connection — lets you plug your computer directly into the phone line.

Pulse (Rotary) or Touch-Tone Dialing — lets your modem dial on any telephone line.

Fax Send/Receive — supports the Group 3 Class I standard with a transmission rate of 9600 bps.

Hayes Autosync — lets you work within a 3270 environment.

This manual provides general information about your modem, explains how to connect the modem to the telephone line, gives troubleshooting information, and provides a quick reference to direct modem commands. Refer to the manuals that come with your software for specific communications applications and instructions.

HOW YOUR MODEM WORKS

You really do not need to know this information to begin using your modem. But, a quick explanation about how your modem works might make you more comfortable in using the device.

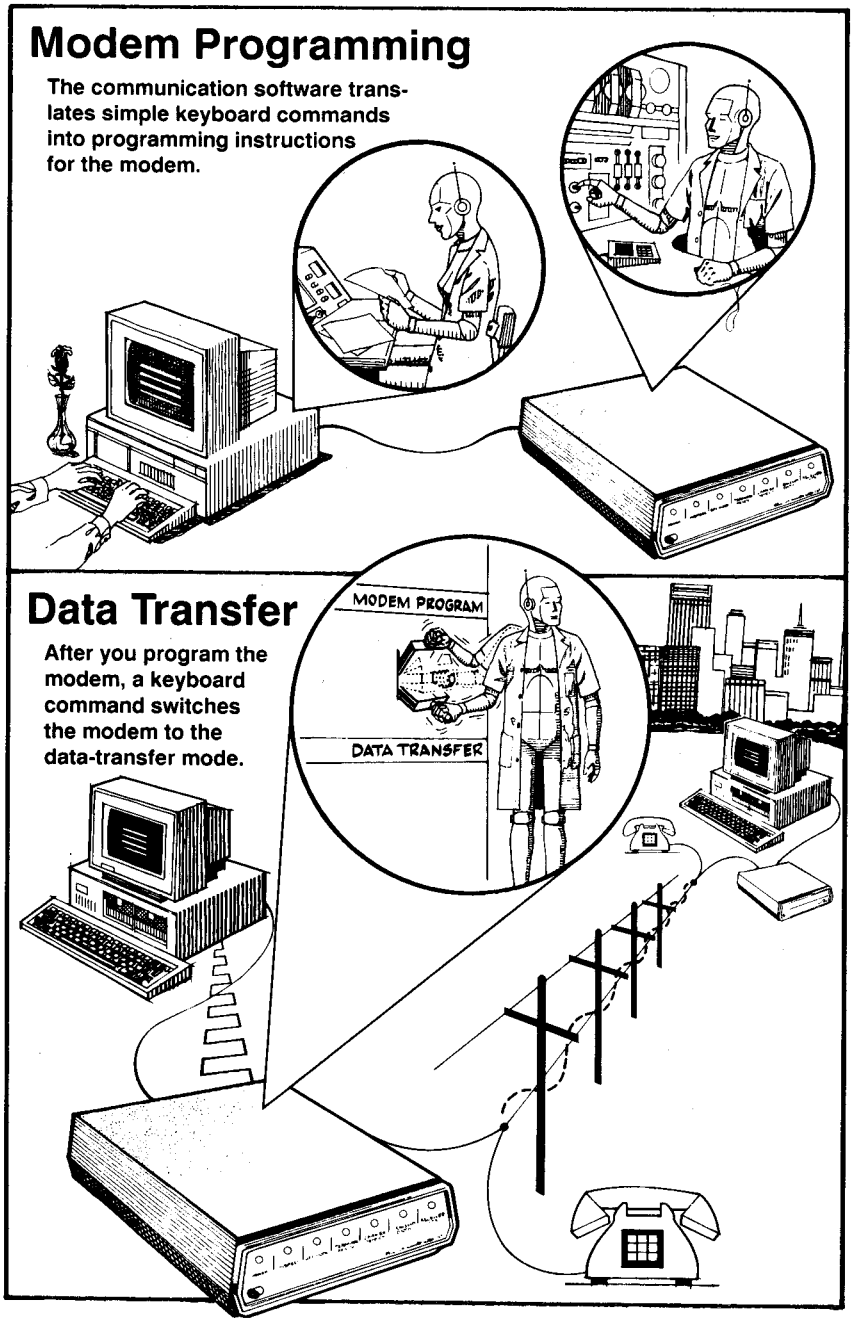
Before a modem can work, you must also have communications software that converts what you type into information the modem understands. This software is easy to use. It prompts you for information it needs, such as the telephone number to dial and the modem's communication speed. Then, it automatically generates the modem commands to dial the telephone number and connect to the computer service at the other end.

Imagine a telephone operator inside your computer that takes the information you specify, and then sets the proper switches and pushes the correct buttons to dial and connect to the modem in the receiving computer. When the connection is made, the imaginary operator throws one last imaginary switch that causes your computer to begin communicating with the other computer.

Your modem switches from the *command* (or modem program) mode to the *communications* (or data transfer) mode. Of course, for all of this to work, you must tell your computer to call another computer that has a modem connected.

Now the communications software takes on a new job. It displays everything your modem receives from the computer you called, and sends everything you type to the modem. Then, the modem transmits this information to the other computer. The communications software can also send and receive entire files.

A modem lets you sit down at your computer and communicate with literally thousands of other computers, all across the country.


Modem Programming
The communication software translates simple keyboard commands into programming instructions for the modem.
Data Transfer
After you program the modem, a keyboard command switches the modem to the data-transfer mode.
MODEM PROGRAM
DATA TRANSFER

CONNECTING THE MODEM TO THE PHONE LINE

Before you can use your modem, you must connect it to the telephone line.

1. Plug one end of a modular telephone cable into the modular telephone jack on the back of the computer.
2. Plug the cable's other end into a modular telephone jack. (The telephone company refers to this jack as USOC type RJ-11.)

TROUBLESHOOTING

If you have problems with your modem (garbled data, intermittent errors, and so on), check to see that:

- The phone connection is clean and noise-free
- No one is talking on the telephone line
- The phone and all extensions are on the hook
- The operation speed is correct for the modem you are using and the modem with which you are communicating
- The modem is not connected to a cellular telephone network

If you still cannot transmit data, disconnect your modem to see if the phone line is operating correctly. If it is, the trouble is probably in your modem. Contact the GRiD Resource Center for assistance or possible repair.

In the unlikely event that your modem causes problems on the telephone line, the telephone company can disconnect your service. If advance notice is not practical, the telephone company notifies you as soon as possible and advises you of your right to file a complaint with the FCC.

Also, the telephone company can change its lines, equipment, operations, or procedures that could affect the operation of this modem. The telephone company notifies you of these changes in advance, so that you can take the necessary steps to prevent interruption of your telephone service.

AT COMMAND SET

In most cases, you do not need to learn the modem command set. Instead, you learn to use your own communications software and let the software control the modem. You must use a communications software package, such as Crosstalk or Procomm Plus, to put your modem in the terminal mode. Most commercially available packages not only put the computer in the terminal mode, but also take direct control of the modem. The AT command set is nevertheless documented here for special cases when you might need to directly control the modem. The AT command sets your modem supports include EIA-578 (Class 1) industry standard Hayes and Microcom command set extensions for MNP operation.

The AT commands described in this manual are available to you whenever the computer is in the terminal mode and the modem is in the command state, regardless of what communications software you are running.

Putting the Modem in the Command State

When the computer is in the terminal state and your communications software is running, the software intercepts any keyboard entries. To issue commands directly to the modem, you must set the modem to the command state. To put the modem in the command state from the on-line state, enter the escape command. The default escape command is three plus signs (+++). The first + must be separated from any previous keystroke by at least 1 second, and the last + must be separated from any following keystroke by at least 1 second.

Issuing Modem Commands

Modem commands are given according to a simple syntax. Once the computer is in the command state, give the modem a command by typing the command characters on a single line and then pressing **ENTER**. Prefix all commands with the letters, *AT* or *at*, which *get the modem's attention*. The escape sequence (+++) and the repeat previous command (A/) are the only exceptions — you send these commands without the AT prefix and **ENTER**. You can enter modem commands in all uppercase letters or all lowercase letters. The modem ignores spaces between characters. If you make a typing error, press the backspace key and enter the correct character.

Command Line

A command line can contain up to 40 characters. You can send one or more commands to the modem on the same command line. The modem does not count the AT prefix and the carriage return at the end of the command line as part of the 40 characters.

On-Line State

The modem goes on-line after it connects with a remote computer. When the modem is on-line, the computer can transmit and receive data.

Factory Configuration

The modem's configuration is defined with AT commands and S-registers. You can recall command settings from three areas: factory configuration, active configuration, and user profiles. The factory configuration reflects the settings that meet most communication needs. You can reconfigure these factory settings (sometimes called default settings) for specific operating conditions. You can save most parameters to nonvolatile memory. Some, however, are nonstorable and you must reconfigure each individually following each reset.

Note: The modem port is factory set to Com 2. Set the communications software to operate with Com 2. To change the modem's port to Com 1, use the computers setup program.

LIGHTNING

Your modem has built-in protection circuits to reduce the risk of damage from surges in telephone line current. These protection circuits meet or exceed FCC requirements. However, lightning striking the telephone lines can damage the modem.

Lightning damage is not common. Nevertheless, if you live in an area that has severe electrical storms, we suggest you unplug your modem during storms to reduce the possibility of damage.

THE FCC WANTS YOU TO KNOW

We have designed your modem to conform to federal regulations, and you can connect it to most telephone lines. However, each modem (and each device, such as a telephone) that you connect to the telephone line draws power from the telephone line. We refer to this power draw as the device's *ringer equivalence number*, or REN. The REN is shown on the label inside the modem compartment cover.

If you use more than one device on the line, add all the RENs. If the total is more than five, your telephones might not ring. In rural areas, a total REN of three might impair ringer operation.

Your modem complies with Part 68 of *FCC Rules*. You must, upon request, provide the FCC registration number and the REN to the phone company. Both numbers are on the modem.

Note: You must not connect your modem to:

- Coin-operated systems
- Party-line systems
- Most electronic key telephone systems

This modem complies with Part 15 of the *FCC Rules*. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifying or tampering with your modem can cause a malfunction and might invalidate the modem's warranty and void your FCC authorization to operate the modem. If your modem is not operating as it should, contact the GRiD Resource Center. Our personnel can assist you and arrange for service, if needed. If the trouble is harming the telephone lines, the telephone company might ask you to disconnect your modem until you have resolved the problem.

CANADIAN DEPARTMENT OF COMMUNICATIONS (DOC) NOTICE

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before you install this equipment, be sure that it is permissible to connect the equipment to the local telecommunications company's facilities. You must also install the equipment using an acceptable connection method. In some cases, the company's inside wiring associated with a single-line individual service can be extended using a certified connector assembly (telephone extension cord). Be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations the user makes to this equipment, or equipment malfunctions, can give the telephone company cause to request that the user disconnect the equipment.

Ensure for your own protection that the electrical ground connections of the power utility and telephone lines are connected to an internal metallic water pipe system, if present. This precaution can be particularly important in rural areas.

Caution: Do not attempt to make such connections yourself. Contact the appropriate electric inspection authority or electrician, as appropriate.

Load Number

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop which is used by the device to prevent overloading. The termination on a loop can consist of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100B.

The modem has been assigned a Load Number of 29.

ERROR CORRECTION AND COMPRESSION (MNP AND V.42 LAPM PROTOCOLS)

Your modem can provide an error-free communications link when you connect to another modem that supports either the MNP4 or V.42 LAPM protocol. As factory configured, this option is disabled. To enable this feature, you should send the modem the following command before you dial the other system:

AT\N5\Q3

Your modem can also provide an effective data transfer rate at higher than 2400 bps. To do this, the modems transmit a compressed form of the data and decompress the data upon receipt. The modem you connect to must support V.42 bis or the MNP5 protocol to take advantage of data compression. As factory configured, this option is disabled. To enable this feature, you should enable error correction as explained above and send the modem the following command before you dial the other system:

AT%C1\J0

Then, set your communications software to 19,200 bps. The modem automatically adjusts its communications rate to the highest supported by the other modem, and communicates with your software at the rate you set. The speeds do not have to be the same when you set \J0. Data compression is not effective when you send or receive files that have been software compressed.

If your software does not expect modem return codes, you can monitor the progress of the connection to see which protocols are in effect by sending the modem the following command:

ATW1

COMMAND SET

This section describes the AT command set for the MNP/FAX modem. This modem provides the Hayes standard AT command set for auto dialing, Microcom Networking Protocol (MNP) AT command subset, and Class 1 Fax (EIA-578) command set.

AT (attention command)

Unless otherwise noted, all modem commands must begin with the characters AT. (The AT prefix must be either all uppercase or all lowercase.) These characters stand for *attention*, and they tell the modem that subsequent characters constitute a command to the modem rather than data to be transmitted. The AT command set lets you combine commands on a line. After you press **ENTER**, the modem executes the commands in the order they appear.

Example: AT *command characters*

AUTOMATIC DIALING COMMANDS

D (dial command)

Instructs the modem to dial the number specified by subsequent digits. You do not need to enter spaces, hyphens, or parentheses; if present, the modem ignores them. Valid dial string characters are 0-9, #, *, A, B, C, and D. You can use the following options with the Dial command: P T , ; " ! W @ R S=n

Example: ATD4085551212

P (pulse dialing command)

Instructs the modem to use pulse dialing. You can enter this alone or with a dial command. Pulse dialing is the default when you first power the modem.

Example: ATP
Example: ATDP4085551212

T (Touch-Tone dialing command) Instructs the modem to use touch-tone dialing. You can enter this alone or with a dial command.

Example: ATT
Example: ATDT4085551212

, (pause command) Each comma you insert in a dial command causes a 2-second delay (or the value of register S8) at that point in the dial sequence. Enter a pause when you need to dial part of a number, wait for dial tone or signal of some sort, and then resume dialing. In the example, a 4-second delay is inserted after dialing 9 to get an outside line.

Example: ATD9,,4085551212

; (return to command state after dialing) Makes the modem dial the number and return to the command state (the OK prompt) without hanging up. Ordinarily, the modem goes on-line as soon as it connects. When the modem is on-line, you can only issue the escape command. When you end a dial command with a semicolon (;), the modem dials the number, but does not go on-line when the connection is made.

Example: ATD4085551212;

! (flash switch hook command)

Makes the modem "flash" the switch hook[1] for 1/2 second, then "release" the switch hook before continuing to dial. On some telephone systems, you can use this command to transfer a call to another line. The example below transfers a call and hangs up (the H command is discussed in the following section).

Example: ATD!1507;H

W (wait for second dial tone command)

Makes the modem wait for a second dial tone at this point in the dial command before dialing remaining digits. Use this command to access a service that requires you to dial an access number, wait for a dial tone, and then dial another number or enter a code. You can use the W command only when the result code command currently in effect is X3 or higher. You can use the W command more than once in a single dial command.

Example:
ATD9501022W04085551212W8645
5478853064

1 The term "switch hook" refers to the mechanism your telephone uses to distinguish between a raised and a lowered receiver. On the most common types of telephone, the two buttons on which the handset rests constitute the switch hook. On a wall-mounted phone, the switch hook is the bracket from which the receiver hangs when the phone is not in use.

@ (wait for silence command)

Makes the modem wait for 5 seconds of silence at the other end of a completed call before dialing any remaining digits. Use this command when you need to wait for a recorded message to complete before entering digits in response to that message. To use the @ command, set the result code command to X3 or higher. You can use the @ command more than once in a single dial command. In the example below, assume that the @ command corresponds to a recorded message asking you to enter your access code. The dialing operation stops while the message plays. Five seconds after the message completes, the modem dials the access code digits.

Example: ATD4085553825@32863

R (reverse frequency command)

Reverses the modem's originate and answer frequencies. This is necessary when you want to call an originate-only modem. The R command can immediately precede or follow the dialed number.

Example: ATDR4085551212
Example: ATD4085551212R

DS=*n* (dial stored number)

Dials the stored number, where n is location 0-3. See &Zn=x command for information on storing a number.

Example: ATDS=2

A/ (repeat last command)

Causes the modem to repeat the last command. Do not precede this command with the AT (attention command), or terminate it with the **Return** key. In the example, A/ is used to redial a phone number.

Example: ATD4085551212
NO CARRIER
A/

Any key — While the modem is dialing, pressing any character key causes the modem to cancel the call.

MODEM OPERATION COMMANDS

+++ (escape command) — Use this command to place the modem in the command state. Do not precede the escape command with the AT (attention) command, or terminate it with the **Return** key. The first + must be separated from any previous keystroke by at least 1 second, and the last + must be separated from any following keystroke by at least 1 second. Otherwise, the modem interprets the three + signs as part of the data stream instead of the escape command. You must enter the + signs with less than 1 second between each one. Use the ATO command to go back to the on-line state.

Example: *data [1 sec. pause]+++* [1 sec. pause] *command keystrokes*

A (manually answer) — Forces the modem to go off hook in answer mode. Use this command to manually answer a call. You must enter this command last on a command line.

B*n* (CCITT/Bell mode) — Selects either CCITT or Bell standard for 300 and 1200 bps operation. At 2400 bps, the modem selects CCITT V.22bis. At 300 and 1200 bps, you can choose either standard to match the standard the remote system uses.

ATB0 — Selects CCITT V.21/V.22 standard.

ATB1 — Selects Bell 103/212A standard (factory setting).

C1 (normal transmit carrier switching) Some modems use the C command to control the transmit carrier. The C0 option is not valid for the V.42 bis/FAX modem.

E*n* (command-state echo command) Turns local echo off or on for modem commands.

ATE0 Turns off local echo. In this state, the modem does not echo commands you type to the computer.

ATE1 Turns on local echo (factory setting).

F1 (on-line state echo command) Some modems use the **F** command to disable character echo in the on-line state. The F0 option is not valid for the V.42 bis/FAX modem.

H*n* (on/off hook command) Causes the modem to go on hook or off hook.

ATH0 Causes the modem to hang up or go on hook (factory setting).

ATH1 Causes the modem to go off hook (same as picking telephone handset).

I*n* (identification command) The modem uses I*n* to identify the modem code and status of the ROM.

ATI0 Displays the product ID code.

ATI1 Performs checksum on ROM and displays result.

ATI2 Performs checksum on ROM and displays status, either OK or ERROR.

L*n* (speaker volume) Sets the speaker volume to a medium level.

ATL0, ATL1 Low speaker volume.
ATL2 Medium speaker volume (factory setting).
ATL3 High speaker volume.

M*n* (speaker control command) The number you enter to replace *n* determines when the modem's built-in speaker is on and when it is off. The four possible values are shown below.

ATM0 Speaker OFF.

ATM1 ON through dialing and carrier detect; OFF at connection (factory setting).

ATM2 ON continuously, even during data transmission.

ATM3 ON after last digit dialed, until carrier detect; OFF at connection.

O*n* (on-line command) Switches modem from command state to on-line state.

ATO0 Takes the modem from the command state back to the on-line state when a connection is still open.

ATO1 Also returns modem to on-line state and initiates equalizer retrain sequence (at 2400 bps).

Q*n* (quiet command) This command determines whether or not the modem returns result codes.

ATQ0 Causes the modem to return codes (factory setting).

ATQ1 Causes the codes to be suppressed.

S*r*=*n* (register command) Sets register *r* to value *n*. Use this command to change the values stored in any of the modem's registers. (It is unlikely that you will need to do this—do not change register values unless you are sure of what you are doing.) The general form of the register command is shown below. In an actual command, you would replace *r* with the register number and *n* with the value to be set (from 0-255). The registers and their values are listed in Table 1.

ATS*r* = *n*

Table 1. Modem Registers and Values

Register Number	Function	Default Value
0	Sets number of rings before automatic answering.	0
1	Counts and stores number of times the phone rings. Reverts to 0 if no ring occurs for 8 seconds.	0
2	Sets ASCII value of escape code sequence character. A value greater than 127 disables escape sequence.	43 (+)
3	Sets ASCII value of carriage return <CR> character.	13
4	Sets ASCII value of line feed character.	10
5	Sets ASCII value of backspace character.	8
6	Sets number of seconds modem waits for dial tone. Used when X0, X1, or X3 commands are in effect.	2
7	Sets number of seconds modem waits for carrier tone.	30
8	Sets duration of delay generated by comma (,) dial modifier.	2
9	Sets length of time, in tenths of a second, carrier signal must be present for modem to recognize signal and turn on DCD (data carrier detect). Prevents ring or busy signal from being mistaken as carrier.	6
10	Sets duration, in tenths of a second, that modem waits after loss of carrier before hanging up.	14
11	Sets duration, in milliseconds, of spacing between touch-tones during dialing.	95
12	*Reserved*	
13	*Reserved*	
14	*Reserved*	

15	*Reserved*	
16	*Reserved*	
17	*Reserved*	
18	Sets duration, in seconds, of modem diagnostic tests. When a test is active for this length of time, modem automatically terminates the test. 0 disables the timer. The range is 0-255.	0
19	Bit-mapped synchronous options: Bit 1: 0–BSC protocol, 1–SCLC protocol Bit 2: 0–SDLC Address detect off, 1–on Bit 4: 0–SDLC Mark, 1–Flag All other bits ignored.	
20	Contains the synchronous character in BSC mode (32 hex, default), or the SDLC address character in SDLC mode (0, default).	
21	*Reserved*	
22	*Reserved*	
23	*Reserved*	
24	*Reserved*	
25	Delay to DTR (in 100ths of a second). The modem ignores a change in DTR state (ON or OFF) that persists for less than this value. The range is 0-255.	5
26	*Reserved*	
27	*Reserved*	
S*r*?	To display the value stored in register *r*, use the command ATS*r*?, where *r* is the register number that you want to query. **Example:** ATS8?	

V*n* (verbose command)

Determines whether result codes are displayed as numbers or text. See Table 2 for codes and messages.

ATV0 Causes codes to display as numbers.

ATV1 Causes codes to display as text (factory setting).

W*n* (negotiation progress code command)

You can enable an additional set of result codes with the W command. These result codes report the progress of the negotiation phase in the error-correction and compression mode. These codes report the carrier speed and the error-correction protocol. For example, both 77 and PROTOCOL: LAP-M indicate that the error-correction protocol is V.42 LAP-M. See Table 2 for codes and messages.

ATW0 The modem does not report negotiation progress. The modem reports the serial port connect rate on connection.

ATW1 The modem reports negotiation progress. When a reliable link is established, the modem can report a different CARRIER rate and CONNECT rate.

ATW2 The modem does not report negotiation progress. The modem reports the modem (carrier) connect rate on connection (factory setting).

X*n* (result code command)

Every operation the modem performs has one of several possible results. The modem reports the actual result of each operation in the form of a result code from 0 to 80. Each result code has an associated text message. Whether or not a particular result code appears on the screen depends on the result code command (see Table 3). Your choice of a result code set also determines whether or not certain modem functions are enabled, as explained later in this section. The factory setting is X4.

The result codes and their associated messages are shown in Table 2.

Table 2. Result Codes

Code	Message	Connection Indicated
0	OK	Command executed
1	CONNECT	Connection at 300/1200/2400 bps if X0 is set; otherwise, connection at 300 bps
2	RING	Ring signal detected
3	NO CARRIER	Carrier signal not detected, or lost
4	ERROR	Invalid command, checksum, error in command line, or command line exceeds 40 characters
5	CONNECT 1200	Connection at 1200 bps
6	NO DIAL TONE	No dial tone detected
7	BUSY	Busy signal detected
8	NO ANSWER	No silence detected when dialing a system not providing a dial tone (replaces NO CARRIER if an @ is present in the dial string)
10	CONNECT 2400	Connection at 2400 bps
11	CONNECT 4800	Connection at 4800 bps (serial port speed)

12	CONNECT 9600	Connection at 9600 bps (serial port speed)
14	CONNECT 19200	Connection at 19200 bps (serial port speed)
20	CONNECT/REL	Reliable (MNP or V.42 LAP-M) connection with connection speed suppressed (X0)
22	CONNECT 1200/REL	Reliable (MNP or V.42 LAP-M) connection at 1200 bps
23	CONNECT 2400/REL	Reliable (MNP or V.42 LAP-M) connection at 2400 bps
24	CONNECT 4800/REL	Reliable (MNP or V.42 LAP-M) connection at 4800 bps
26	CONNECT 9600/REL	Reliable (MNP or V.42 LAP-M) connection at 9600 bps
27	CONNECT 19200/REL	Reliable (MNP or V.42 LAP-M) connection at 19200 bps
40	CARRIER 300	Carrier detected at 300 bps
46	CARRIER 1200	Carrier detected at 1200 bps
47	CARRIER 2400	Carrier detected at 2400 bps
66	COMPRESSION: CLASS 5	MNP Compression negotiated
67	COMPRESSION: V.42 bis	V.42 bis compression negotiated
69	COMPRESSION: NONE	No compression negotiated
70	PROTOCOL: NONE	Asynchronous mode
77	PROTOCOL: LAP-M	V.42 LAP-M error correction negotiated
80	PROTOCOL: ALT	MNP error correction negotiated

Table 3 lists the result code commands and indicates which result codes are reported according to which command is in effect.

Table 3. Result Code Commands

Command	Codes Reported									
	0	1	2	3	4	5	6	7	8	10
X0	•	•	•	•	•					
X1	•	•	•	•	•	•				•
X2	•	•	•	•	•	•	•			•
X3	•	•	•	•	•	•		•	•	•
X4	•	•	•	•	•	•	•	•	•	•

Command	Enabled by W0				Enabled by W1				
	11	12	14	20	22	23	24	26	27
X0				•					
X1	•	•	•	•	•	•	•	•	•
X2	•	•	•	•	•	•	•	•	•
X3	•	•	•	•	•	•	•	•	•
X4	•	•	•	•	•	•	•	•	•

Command	Enabled by W1									
				Disabled by %C0						
	40	46	47	66	67	69	69	70	77	80
X0				•	•	•	•	•	•	•
X1	•	•	•	•	•	•	•	•	•	•
X2	•	•	•	•	•	•	•	•	•	•
X3	•	•	•	•	•	•	•	•	•	•
X4	•	•	•	•	•	•	•	•	•	•

If you do not enter a result code command, the modem assumes X4, W2, %C0 by default.

	Whether reported codes appear as numbers or as messages depends on what V command is in effect, as explained earlier in this section. **Example:** ATX3
Y (long-space disconnect)	Controls long-space disconnect.
ATY0	Disables long-space disconnect (factory setting).
ATY1	Enables long-space disconnect.
Z*n* (reset command)	Resets modem and recalls profile.
ATZ0	Recalls user profile 0.
ATZ1	Recalls user profile 1.
&C*n* (data carrier detect)	Controls Data Carrier Detect (DCD). You can program the modem to keep DCD on at all times, ignoring data carrier presence or absence, or you can program it to turn on DCD when a data carrier is detected. Use this command if your computer or terminal requires DCD to be OFF at certain times.
AT&C0	DCD always ON; assumes data carrier always present (factory setting).
AT&C1	DCD tracks data carrier from the remote modem; DCD is on when data carrier is detected. Most autodial software requires you to set this option.
&D*n* (DTR control)	Controls DTR transition. Positive transitions of DTR (OFF-to-ON) that occur within 5 seconds after disconnect are ignored. When AT&D2 or AT&D3 is set, DTR must be ON to autoanswer.
AT&D0	Ignores DTR; DTR is not needed for autoanswer (factory setting).
AT&D1	Enters command state when an ON-to-OFF transition of DTR is detected.

AT&D2	Hangs up and enters command state when an ON-to-OFF transition of DTR is detected. Most autodial software requires this option to be set.
AT&D3	Hangs up and resets when an ON-to-OFF transition of DTR is detected.
&F (restore factory settings)	Restores the factory settings as the active configuration. The factory settings are as follows: B1, E1, L2, M1, Q0, V1, W2, X4, Y0, &C0, &D0, &G0, &J0, &L0, &P0, &Q0, &R0, &Y0, %A000, %B2400, %C0, \C0, \G0, \H0, \J1, \K5, \N0, \Q0, \T000, \V0, \X0
&G*n* (guard tone)	Sets guard tone. Calls in the United States do not need guard tones.
AT&G0	Disables guard tone (factory setting).
AT&G1	Sets guard tone on the answering modem to 550 Hz.
AT&G2	Sets guard tone to 1800 Hz.
&J*n* (phone jack type)	Designates the type of jack with which the modem is connected to the telephone line.
AT&J0	RJ11, RJ41S, or RJ45S type phone jack (factory setting).
AT&J1	RJ12 or RJ13 type phone jack.
&L*n* (dial-up line operation)	The **&L** command sets the dial-up line operation mode.
AT&L0	Sets the line type to a dial-up line (default).
AT&L1	Sets the line type to a leased line.
&M0 (asynchronous mode)	Some modems use the **&M** command to set the communication mode. Any value other than &M0 is not valid for the V.42 bis/FAX modem.

&P*n* (pulse dial ratio) Controls the off-hook (make) to on-hook (break) ratio that the modem uses for pulse dialing.

AT&P0 Pulse dial make/break ratio = 39/61 for use in the United States (factory setting).

AT&P1 Pulse dial make/break ratio = 33/67 for use in the United Kingdom.

&Q*n* (asynchronous/ synchronous mode) Selects between the asynchronous and synchronous modes.

AT&Q0 Selects the asynchronous mode. This mode is compatible with most computer services, bulletin boards, and remote connections (factory setting).

AT&Q4 Selects Synchronous Mode 4 (Hayes autosync). In this mode, the modem I/O interface operates asynchronously and the modem translates to BISYNC or SDLC protocol on the telephone line. This is compatible with systems that emulate IBM 3780 Bisync and IBM 3270, 3770, and 5250 SNA terminals. Registers 19 and 20 affect synchronous operation.

&R*n* (CTS control) Selects CTS control. This command only applies when the modem is set to synchronous mode (&Q4).

AT&R0 CTS follows RTS when online. CTS always true in command state (factory setting).

AT&R1 CTS always true.

&S*n* (assume DSR signal) Some modems use the **&S** command to indicate when the modem is connected to a communication channel and ready. Any value other than &S0 is not valid for the V.42 bis/FAX modem.

&T*n* (diagnostic test) This is the modem's diagnostic and test facility.

AT&T0	Ends a test in progress and returns the local and remote modems to normal operation.
AT&T1	Initiates local analog loopback. The modem should display the characters on your screen exactly as you type them.
AT&T2	Initiates local analog loopback test. Same as &T1, except data is transmitted in the higher frequency band and received in the lower frequency band. This helps identify hardware or environmental problems that affect one of the frequency bands, but not the other.
AT&T3	Lets a remote modem that does not support the CCITT V.54 standard perform a local digital loopback test with the modem.
AT&T4	Lets the modem respond to a remote caller's request to enter remote digital loopback mode (factory setting).
AT&T5	Prevents the modem from responding to a remote digital loopback request.
AT&T6	Instructs the remote modem to initiate remote digital loopback.
AT&T7	Instructs the remote modem to initiate a remote digital loopback with self-test.
AT&T8	Initiates remote analog loopback with self-test. The modem sends itself the CCITT V.54 test pattern and verifies these characters to make sure they are received correctly. It reports errors upon completion of the test.
&V (view configuration and profiles)	Displays the active configuration, user profiles, and stored telephone numbers. Do not issue this command in conjunction with other commands. Enter it on a line by itself.

&W*n* (store current configuration)

Saves the storable parameters of the active configuration in memory as one of two user-defined profiles. (The &V command displays the storable parameters.)

AT&W0 — Saves storable parameters of active configuration as user profile 0.

AT&W1 — Saves storable parameters of active configuration as user profile 1.

&Y*n* (recall user profile)

Specifies which profile is recalled on power-up. You can designate either user profile as the default to recall when the modem is powered up.

AT&Y0 — Recalls user profile 0 at power-up (factory setting).

AT&Y1 — Recalls user profile 1 at power-up.

&Z*n*=*x* (store phone number)

Stores dial string (phone number) *x* in location *n*, where *n* is a decimal integer (0 to 3) and *x* is a string of up to 32 characters. Valid dial string characters are 0-9, dial modifiers, and (for tone dialing) A, B, C, D, #, *. The modem ignores invalid characters.

ERROR DETECTION, CORRECTION, AND DATA COMPRESSION COMMANDS

\A*n* (maximum MNP blocksize)

Sets the maximum blocksize the modem uses during a MNP reliable link. For best throughput, select a large blocksize (256 bytes). If you connect through a poor telephone connection, reducing the blocksize might improve throughput by reducing the amount of data to be retransmitted when errors occur.

AT\A0 Maximum MNP blocksize = 64 bytes.

AT\A1 Maximum MNP blocksize = 128 bytes.

AT\A2 Maximum MNP blocksize = 192 bytes.

AT\A3 Maximum MNP blocksize = 256 bytes.

\B (send 300 mS break)

Sends a 300 millisecond break to the remote system.

%A*n* (autoreliable fallback character)

Sets the ASCII character the answering modem recognizes as the autoreliable fallback character, where *n* is a decimal integer between 0 and 127. (The factory setting is 0, meaning the autoreliable fallback character is disabled.)

In autoreliable mode, when the V.42 bis/FAX modem encounters an incoming reliable fallback character from the remote system, it automatically switches to normal mode and passes the character to the serial port. Autoreliable fallback character recognition stops if the modem receives a SYN character (ASCII 22). The modem ignores the autoreliable fallback character parity bit. Note that with this command, you must set both AT\N3 or AT\N5 and AT\C2.

%B*n* (modem port bps rate)

When issued locally, sets the maximum modem port bps rate, where *n* = 300, 1200, or 2400. An AT **Return** command issued locally causes the modem port speed to match the serial port speed, regardless of any previous AT%B setting. The factory setting is 2400.

\C*n* (autoreliable buffer)

Determines if the answering modem buffers the data that it receives from the remote modem during the 3-second interval in which it attempts to establish a reliable connection. Use this command when the answering modem is in autoreliable mode.

When you set AT\C1 or AT\C2, reliable and normal connections can result independent of bps rate adjust. When you set AT\C0, bps rate adjust affects the type of connection as follows: reliable and direct connections can result when bps rate adjust is on (AT\J1); reliable and normal connections can result when bps rate adjust is off (AT\J0).

AT\C0 Does not buffer data during link negotiation. Switches to normal or direct mode if SYN not detected in 3 seconds (factory setting).

AT\C1 Buffers all data on the answering modem until either 200 non-SYN characters are received or a SYN character is detected within 3 seconds. If 200 non-SYN characters are received, the modem switches to normal mode and passes the data through to the serial port. If a SYN character is detected within 3 seconds, the modem attempts to establish a reliable connection. Otherwise, the modem switches to normal mode. If the buffer fills, the modem switches to normal mode.

AT\C2	Does not buffer data on the answering modem. Switches to normal mode upon receipt of a character defined by the AT%A command and passes that character to the serial port. When the modem is set to autoanswer and receives calls from modems that both support and do not support MNP, use autoreliable mode and set AT\C2. This lets the modem switch to normal mode as soon as it detects a logon character (defined by the AT%A command) from a non-MNP caller, thereby eliminating the 3-second wait.
%C*n* (compression control)	Determines whether the modem tries to use data compression during reliable connections. Both modems must have this command set to AT%C1 at the time the connection is established. For the most efficient results, also set the bps rate adjust off (AT\J0).
AT%C0	Disables data compression (factory setting).
AT%C1	Enables V.42 bis and MNP Class 5 data compression.
\G*n* (modem port flow control)	Sets the flow control method the modem uses to pace data sent from the remote modem to this modem during a normal mode connection. **Note:** The reliable link has its own method of flow control and ignores the AT\G setting. However, the serial port flow control settings (AT\Q*n*) remain active during a reliable link.
AT\G0	Disables modem port flow control (factory setting).

AT\G1 Sets modem port flow control to XON\XOFF (the modem sends an XOFF character to stop received data and sends an XON character to resume receiving data.

\H*n* (HP ENQ/ACK support) Lets the modem emulate the Hewlett-Packard ENQ/ACK protocol when an MNP reliable link is established. The modem can use flow control in addition to the ENQ/ACK protocol. Data blocks should not exceed 250 characters each.

AT\H0 Disables HP ENQ/ACK protocol (factory setting).

AT\H1 Enables HP ENQ/ACK protocol during MNP reliable link. Modem emulates terminal.

AT\H2 Enables HP ENQ/ACK protocol during MNP reliable link. Modem emulates host.

Use the HP ENQ/ACK protocol as follows:

1. Set the modem at the host to AT\H1.
2. Set the modem at the terminal to AT\H2.
3. Enable either XON/XOFF (AT\Q1) or hardware (AT\Q3) flow control on the serial port on both modems to prevent data loss.
4. Establish an MNP reliable link.

\J*n* (bps rate adjust) Controls the bps rate adjust feature. To retain the highest throughput, disable the bps rate adjust when you use data compression, and set the serial port speed (through your communications software) to 19200 bps.

AT\J0 Disables the bps rate adjust feature. The serial port is independent of the rate of the connection.

AT\J1 Enables the bps rate adjust feature (factory setting). After a connection is made, the modem adjusts the speed of the serial port to match the speed of the connection. The serial port remains at the adjusted bps rate after the connection terminates. If your computer or terminal does not automatically change to the adjusted bps rate, you must manually change the bps rate to the new setting.

\Kn (break control) Determines what the modem does when it receives a BREAK from the computer or remote modem. During MNP mode, the remote modem's BREAK control setting determines how this modem handles BREAK. The factory setting is \K5.

When the modem receives a BREAK from the local computer during normal or MNP operation:

AT\K0,2,4 Modem enters the command mode (waiting for AT) without sending a BREAK to the remote modem.

AT\K1 Modem clears the terminal and modem buffers and sends a BREAK to the remote modem.

AT\K3 Modem does not clear the buffers, but sends a BREAK to the remote modem.

AT\K5 Modem sends a BREAK to the remote modem in sequence with any transmitted data.

When the modem receives a BREAK from the remote modem during normal mode:

AT\K0,1 Modem clears the terminal and modem buffers and sends a BREAK to the computer.

AT\K2,3 Modem does not clear the buffers, but sends a BREAK to the computer.

AT\K4,5 Modem sends a BREAK to the computer in sequence with any data being buffered.

When the modem receives a BREAK from the computer during direct mode:

AT\K0,1,2 Modem sends a BREAK to the remote modem and enters the command mode.

AT\K3,4,5 Modem sends a BREAK to the remote modem.

Note: In LAPM mode, the modem tries to preserve the break duration when transmitting it to a remote modem. MNP can not maintain the break duration; long and short breaks are the same duration.

\N*n* (operating mode) Selects the operating mode the modem uses while connected. The operating mode determines how the modem communicates with the remote system.

AT\N0 Sets normal mode; no error correction (factory setting). In normal mode, when bps rate adjust is OFF (\J0), the serial and modem ports can operate at different speeds. Use flow control to avoid data loss.

AT\N1 Sets direct mode. The modem does not buffer data, and ignores flow control (\G) and bps rate adjust (\J). Upon connection, the serial port always adjusts to the connect speed, regardless of the setting of bps rate adjust command. The escape code sequence is disabled in direct mode.

AT\N2

Sets reliable mode. Uses MNP to provide error detection and automatic data retransmission if an error occurs. This ensures error-free communications between your system and the remote system. The remote system must also be able to handle an MNP link. The modem tries to establish a reliable link immediately after connecting. If the attempt fails, the modem disconnects.

During an MNP link, use serial port flow control. When the modem detects a transmission error, it holds serial port data in a buffer while correcting the error. The remote system should also support flow control.

Note: Some software error-correction protocols, such as Kermit or XMODEM, might not work well with MNP and can interfere with its effectiveness. If you use a protocol through your software, it should have a large (1k) block size to minimize interference.

AT\N3

Sets autoreliable mode. This mode lets a modem communicate both with remote systems that do support and remote systems that do not support MNP links. The answering modem looks for MNP protocol characters. If it detects them within about 3 seconds, it tries to establish a reliable link connection.

When the modem is set to auto answer, you can shorten this period with the AT%A and AT\C2 commands. Set AT\C2 so the modem recognizes an incoming autoreliable fallback character. When the modem receives this character, it stops waiting for a MNP protocol character and falls back to a normal connection.

Note: Even if you set both modems to autoreliable mode, a normal connection or no connection could result due to noise on the telephone line.

If the modem does not detect incoming MNP characters, and bps rate adjust is ON (AT\J1) and autoreliable buffer is OFF (AT\C0), the modem establishes a direct connection. If bps rate adjust is OFF (AT\J0), the modem falls back to a normal connection and uses flow control, if it is enabled.

AT\N4 Sets reliable mode using V.42 LAPM protocol with fallback to MNP. If the modem cannot establish a V.42 LAPM link, the modem tries to establish a MNP reliable connection. If the modems cannot establish a MNP connection, the call is dropped.

AT\N5 Sets autoreliable mode using V.42 LAPM protocol. If the modem cannot establish a reliable link using V.42, the modem tries MNP. If the MNP attempt also fails, the modems establish a connection following the same parameters as documented under AT\N3.

\OFF (power-off mode) Sets the modem to the power-save mode. In this mode, the modem uses only about 2.5 milliwatts. The next character sent turns on the modem. This character is lost.

\Q*n* (serial port flow control)

Sets the serial port flow control type. If you set the serial port speed faster than the modem port speed, data from your computer or terminal enters the modem faster than the modem sends it out. The modem holds characters in a buffer and sends them out at the slower modem port bps rate. When the buffer fills, flow control instructs your computer or terminal to stop transmitting data to the modem; the modem continues to send out the characters and empty the buffer. When there is room in the buffer, flow control instructs your computer or terminal to resume transmitting data to the modem.

For reliable connections, retransmission can reduce the effective modem port speed. If this occurs, flow control prevents buffer overflow.

The modem does not use flow control during direct mode connections.

AT\Q0 Disables flow control (factory setting).

AT\Q1 Enables bidirectional XON/XOFF flow control. Transmission is stopped by sending an XOFF character and is restarted by sending an XON character. The modem generates XON and XOFF characters at the same parity as used on the serial port. The serial port also responds to XON and XOFF characters sent to it from the local computer or terminal.

AT\Q2 Enables unidirectional hardware flow control. The modem turns CTS OFF to stop the local computer or terminal from transmitting data, and turns CTS ON to allow the local computer or terminal to resume transmitting data.

AT\Q3 Enables bidirectional hardware flow control using CTS and RTS. The modem uses CTS to start and stop data transmission from the local computer or terminal. When RTS is OFF, the modem stops transmitting data to the local computer or terminal. When RTS is ON, the modem resumes sending data.

AT\Q4 Enables unidirectional XON/XOFF flow control. The modem serial port generates, but does not respond to, XON/XOFF flow control characters. This setting lets computers transmit data that has XON/XOFF data characters. You can still set the computer to respond to XON/XOFF flow control characters sent to it from the modem during serial port flow control.

AT\Q5 Enables unidirectional hardware flow control, but also keeps CTS OFF until a connection is established.

AT\Q6 Enables bidirectional hardware flow control, but also keeps CTS OFF until a connection is established.

\T*n* (inactivity timer) Specifies the number of minutes the modem waits before automatically hanging up when data is not sent or received. The range for *n* is 0-90 with a factory setting of 0. AT\T0 disables the inactivity timer. The inactivity timer is only available during normal and reliable link connections. It is ignored when the modem is in direct mode.

\V*n* (MNP result code form) Determines whether result codes are returned to indicate a reliable link connection is in effect.

AT\V0	Disables modified MNP result codes. The modem uses the results codes listed with the ATV command. Use AT\V0 when the communications software you use does not expect to see a reliable link result code, even if a reliable connection is made (factory setting).
AT\V1	Enables modified MNP result codes. Use this setting when your software supports MNP result codes.
%V (display modem firmware version)	Displays the modem firmware version.
\Xn (XON/XOFF pass-through)	Determines whether the modem passes XON/XOFF (DC1/DC3) codes through to the computer or filters them out.
\X0	The modem filters out all XON/XOFF codes. (factory default)
\X1	The modem passes XON/XOFF codes through to the computer.
\Z (switch to normal mode)	Causes the local and remote modems to switch to normal mode during a reliable link. Switching to normal mode erases all data in the buffer. **This command is for advanced use only.** If AT\J1 and AT\C0 are set, this command forces the modem to direct mode rather than to normal mode.

CLASS 1 (EIA-578) COMMAND SET

+FCLASS? (Service Class Indication)	Displays the current Class setting. The setting will be: 0 indicates a data modem 1 indicates a Class 1 fax modem

+FCLASS=? (Service Class Capabilities)

Displays the Classes available. The response is a list of values separated by commas. The values are those given in FCLASS?. For example, a modem that supports data communication and facsimile Class 1 would respond: "0,1".

+FCLASS=value (Service Class Selection)

Sets the Class to the values given in FCLASS?. To configure a modem for Class 1, use the command: "AT+FCLASS=1".

+FTS=<Time> (Stop transmission and pause)

Causes the modem to stop any transmission. The modem waits for the specified amount of time and sends the OK result code. Time is in 10 ms intervals in the range 0-255.

+FRS=<Time> (Wait for silence)

Causes the modem to listen and to report back an OK result code when silence has been present on the line for the amount of time specified. Time is in 10 ms intervals in the range 0-255.

+FTM=<MOD> (Facsimile Transmit)

Causes the modem to transmit data using the modulation selected in <MOD>, which can have the values shown in Table 4).

+FRM=<MOD> (Facsimile Receive)

Causes the modem to enter receive mode using the modulation specified in <MOD>, which can have the values shown in Table 4.

+FTH=<MOD> (HDLC Transmit)

Causes the modem to transmit data framed in the HDLC protocol using the modulation mode selected by <MOD>, which can have the values shown in Table 4.

+FRH=<MOD> (HDLC Receive) Causes the modem to receive HDLC framed data using the modulation mode selected in and deliver the next received frame to the DTE. <MOD> can have the values shown in Table 4.

Table 4. <MOD> Parameter Values

Value	Modulation	Speed
3	V.21 ch.2	300
24	V.27ter	2400
48	V.27ter	4800
72	V.29	7200
96	V.29	9600

Note: To obtain a copy of the EIA-578 specification, contact the Electronic Industry Association, P.O. Box 57258, Washington, DC 20037-0258; telephone (202) 457-8734.

With the exception of +FCLASS, all Class 1 commands return an ERROR result code if issued when the modem is on-hook.

You can query all Class 1 commands that use the <MOD> parameter for the range of supported values. When the +FCLASS setting is a Class 1 FAX modem (+FCLASS = 1), the query syntax is: +(command) = ?

MNP/FAX MODEM SPECIFICATIONS

Communication Modes

Asynchronous, MNP Classes 1-5, V.42 LAPM, V.42 bis, Hayes AutoSync, CCITT Group III Facsimile

Communication Rates and Communication Standards Supported

300 bps Bell 103

300 bps CCITT V.21

1200 bps Bell 212A

1200 bps CCITT V.22

2400 bps CCITT V.22bis

2400 bps CCITT V.27

4800 bps CCITT V.29

7200 bps CCITT V.29

9600 bps CCITT V.29

FAX Compatibility

Group III

Error Control

Microcom Networking Protocol (MNP) Class 4, V.42 LAPM, and V.42 bis

Data Compression

Microcom Networking Protocol (MNP) Class 5

Command Set

Class 1 (EIA-578) "AT" command set

Hayes "AT" command set

Microcom "AT" command subset

Operating Modes

Full duplex at 2400 bps and below

Half duplex for Group III Facsimile

Flow Control

None, RTS/CTS, XON/XOFF (Start/Stop), Transparent XON/XOFF, HP ENQ/ACK

Call Progress Monitoring

Dial tone, busy tone, ring detect, answer tone

Dialing Capability

Command-selectable tone or pulse dialing

Command Buffer

40 characters

Receive Levels

-9 to -43 dBm

Transmit Levels

-10 dBm to -9 dBm

Carrier Detection Level

On > -43 dBm and off < -48 dBm

Line Requirements:

Two-wire switched network (standard telephone line)

Ringer Equivalence:

0.4B

Regulatory Approvals:

FCC Part 68 and Part 15

CSA/DOC

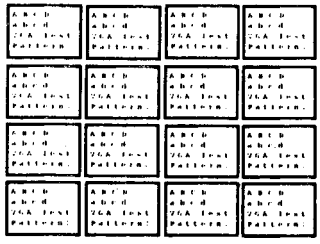
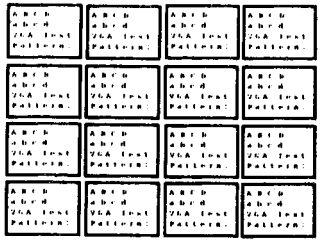
UL

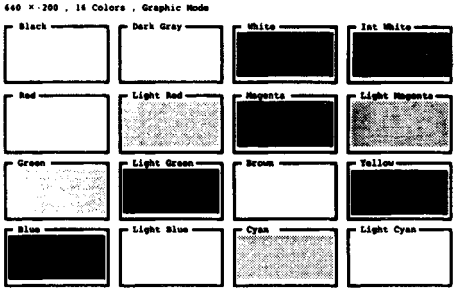
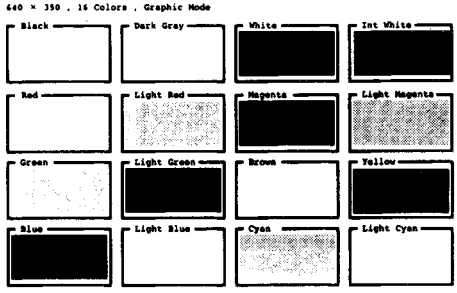
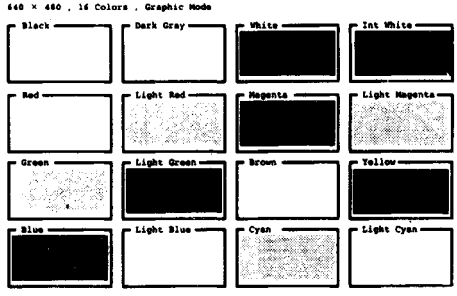
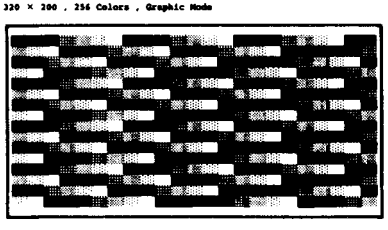
APPENDIX B - DIAGNOSTICS

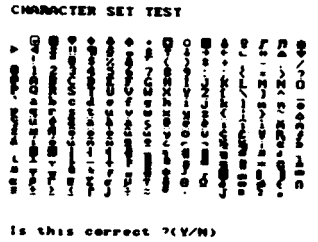
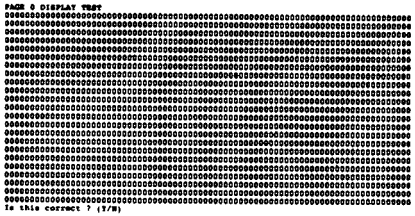
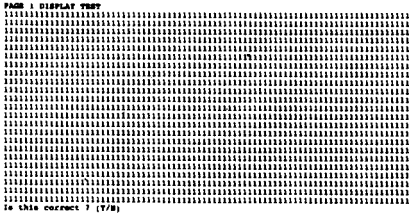
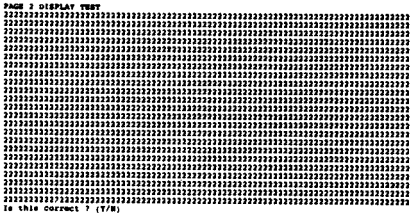
For your convenience, GRiD has included a diagnostics program on the utilities diskette for you to use when asked to by the personnel at the GRiD Resource Center. If you have a problem with your computer, contact the GRiD Resource Center at 1-800-654-GRID.

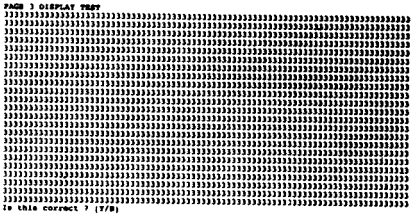
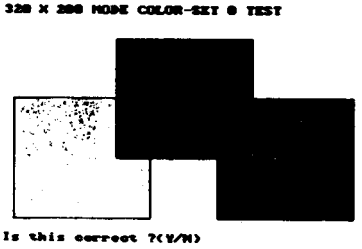
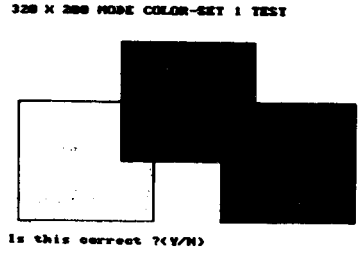
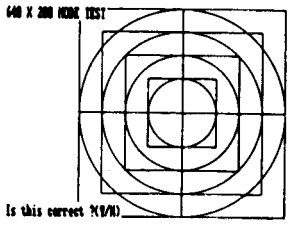
The following chart outlines a typical diagnostic test.

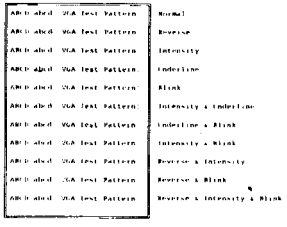
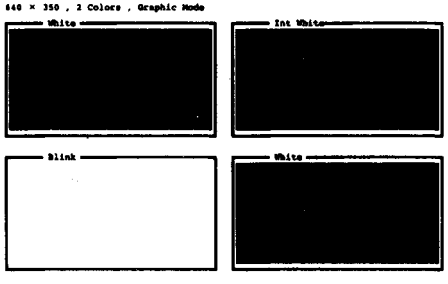
Test Procedure	Screen displays:
1. Insert the Utilities diskette into Drive A and type `a:diag1755` and press ENTER.	Do you want printed output? (Y/N)
2. Press Y (for "Yes") if you want printed output, otherwise press N key.	DIAGNOSTIC MENU (Ver.x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxx KB EXTENDED RAMDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE • 10. 1 HARD DISK DRIVE • 11. VIDEO 12. 1 PRINTER PORT • 13. 2 SERIAL PORT SELECT MENU: 1_
3. Press ENTER. The following tests automatically run.	MAIN BOARD TEST
	BASE RAM TEST CURRENT BASE RAM SIZE = 640 KB Base RAM = 640 KB Check OK
	EXTENDED RAM TEST CURRENT EXTENDED RAM SIZE = xxx KB EXTENDED RAM = xxxx KB Check OK

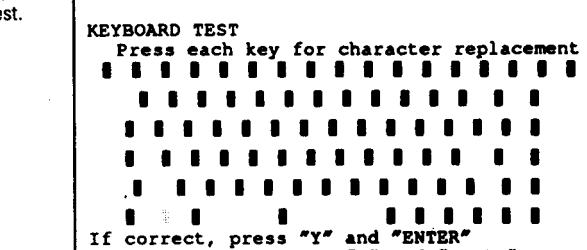
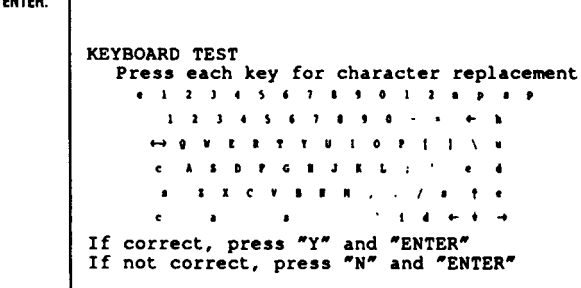
Test Procedure	Screen displays:
	KEYBOARD RETURN CODE TEST FLOPPY DISK CONTROLLER TEST 1st FLOPPY DISK DRIVE (1.44FD) TEST
	HARD DISK CONTROLLER TEST 1st HDD–DRIVE TEST Count value to get SEEK COMPLETE =0
	1st HDD–SEQUENTIAL SEEK TEST Cylinder = xxx 1st HDD–RANDOM SEEK TEST Cylinder =xxx
4. The first graphics screen appears.	
5. Press Y.	

Test Procedure	Screen displays:
6. Press Y.	
7. Press Y.	
8. Press Y.	
9. Press Y.	

Test Procedure	Screen displays:
10. Press Y.	
11. Press Y.	
12. Press Y.	
13. Press Y.	

Test Procedure	Screen displays:
14. Press Y.	
15. Press Y.	
16. Press Y.	
17. Press Y.	

Test Procedure	Screen displays:
18. Press Y.	
19. Press Y.	
20. Press any key.	1st serial port test (I/O address 3F8H) 1st serial port test (I/O address 3F8H) 2nd serial port test (I/O address 2F8H) 2nd serial port test (I/O address 2F8H) Test done!! Hit any key when ready_
21.Press 8 and ENTER.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxxKB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE •10. 1 HARD DISK DRIVE •11. VIDEO 12. 1 PRINTER PORT •13. 2 SERIAL PORT SELECT MENU: 1_

Test Procedure	Screen displays:
22. Press 5 and ENTER.	KEYBOARD 1. TEST ALL DEVICES (* DEVICES) 2. TEST AUTOMATICALLY (* DEVICES) 3. CHANGE MENU 4. EXIT 5. PRESS KEY TEST * 6. SCAN CODE RETURN TEST SELECT MENU: 1_
23. Press 5 and ENTER.	PRESS KEY TEST 1. TEST ALL DEVICES (* DEVICES) 2. TEST AUTOMATICALLY (* DEVICES) 3. CHANGE MENU 4. EXIT 5. U.S.A. 6. GERMANY 7. FRANCE 8. ITALY 9. U.K. 10. SPAIN 11. SWEDEN 12. SWISS (Gr) SELECT MENU: 1_
24. Press all keys for keyboard test.	
25. Press Y and ENTER.	

Test Procedure	Screen displays:
26. Press 4 and ENTER.	PRESS KEY TEST 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT 5. U.S.A. 6. GERMANY 7. FRANCE 8. ITALY 9. U.K. 10. SPAIN 11. SWEDEN 12. SWISS (Gr) SELECT MENU: 5_
27. Press 4 and ENTER again.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxxKB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE •10. 1 HARD DISK DRIVE •11. VIDEO 12. 1 PRINTER PORT •13. 2 SERIAL PORT SELECT MENU: 12_
28. Press 1 2 and ENTER. **Note**: Printer must be connected.	1st Printer port test (I/O address 378H) Connect printer Hit any key when ready _
29. Press any key.	Test done!! Hit any key when ready_ Printing Sample 1st Printer port test (I/O address 378H) !"#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno "#$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop #$%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq $%&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr %&'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs &'( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst '( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu ( )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw *+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx

Test Procedure	Screen displays:
30. Press 1 3 and ENTER.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (* DEVICES) 2. TEST AUTOMATICALLY (* DEVICES) 3. CHANGE MENU 4. EXIT * 5. MAIN BOARD * 6. 640 KB BASE RANDOM ACCESS MEMORY * 7. xxxxKB EXTENDED RANDOM ACCESS MEMORY * 8. KEYBOARD * 9. 1 FLOPPY DISK DRIVE *10. 1 HARD DISK DRIVE *11. VIDEO 12. 1 PRINTER PORT *13. 2 SERIAL PORT SELECT MENU: 13_
31. Press 5 and ENTER.	SERIAL PORT 1. TEST ALL DEVICES (* DEVICES) 2. TEST AUTOMATICALLY (* DEVICES) 3. CHANGE MENU 4. EXIT * 5. 1st SERIAL PORT TEST * 6. 2nd SERIAL PORT TEST SELECT MENU: 1_
32. Press 7 and ENTER.	1st SERIAL PORT 1. TEST ALL DEVICES (* DEVICES) 2. TEST AUTOMATICALLY (* DEVICES) 3. CHANGE MENU 4. EXIT * 5. RS232C CONTROLLER REGISTER R/W TEST * 6. INTERNAL LOOPBACK TEST 7. EXTERNAL LOOPBACK TEST SELECT MENU: 1_
33. Press any key.	1st serial port test (I.O address 3F8H) Connect loopback plug Hit any key when ready_
34. Press any key.	Test done!! Hit any key when ready_

Test Procedure	Screen displays:
35. Press 4 and ENTER to exit the diagnostics program.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxxKB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE •10. 1 HARD DISK DRIVE •11. VIDEO 12. 1 PRINTER PORT •13. 2 SERIAL PORT SELECT MENU: 13_

APPENDIX C - CONFIGURATIONS

It is impossible for us to anticipate every way that you might configure your GRiD 1755 or what software you might use. The following chart shows what might be required under certain conditions.

Software	Purpose	Conditions
TEMM1755.SYS	Expanded memory management	Must be loaded before any other device driver. TEMM1755 allows use of the Resume feature.
HIMEM.SYS	Loading DOS in high memory	Must be loaded after TEMM1755.SYS if TEMM1755.SYS is used
Lotus 3.0		Can run with or without HIMEM.SYS. Resume may be used.
Windows 3.0 (Real Mode)		None
Windows 3.0 (Standard Mode)		Requires HIMEM.SYS. Resume may be used.
Windows 3.0 (Enhanced 386 Mode)		Requires HIMEM.SYS. Cannot use Resume
EMM386.SYS	Loading applications in high memory and expanded memory emulation	Requires HIMEM.SYS. Cannot use Resume

VIRTUAL 8086 MODE

Any software, such as Windows 3.0 in the 386 mode or EMM386.SYS, that uses the virtual 8086 mode conflicts with the Resume feature. You cannot use the Resume feature with this software.

OTHER EXPANDED MEMORY MANAGERS

If you are using an expanded memory manager other than TEMM1755.SYS or EMM386.SYS, it might not correctly recognize the 1755's video ROM. If you use other memory managers, you should exclude the high memory from C600 to C800. See the memory manager's documentation for information about the Exclude command.

COMPUTER CARE

Your GRiD 1755 Notebook Computer is an example of superior design and craftsmanship. The following suggestions will help you care for and enjoy your computer for years.

- Keep your computer and its diskettes dry. If they get wet, wipe them dry immediately. Liquids can contain minerals that can corrode electronic circuits.
- Handle your computer gently and carefully. Dropping your computer can damage circuit boards, the display, case, and can cause your computer to work improperly.
- Use and store your computer and its diskettes only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries and diskettes, and distort or melt plastic parts.
- Keep your computer and its diskettes away from dust and dirt, which can cause premature wear of parts.
- Wipe your computer with a dampened cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean your computer.

Modifying or tampering with your computer's internal components can cause a malfunction and might invalidate your computer's warranty. If your computer is not performing as it should, take it to a GRiD Resource Center. Our personnel can assist you and arrange for service, if needed.

SPECIFICATIONS

Processor	80386 SX, 20MHz
Dimensions	12.2 x 1.7 x 10 Inches
Weight	.6.7 lbs
Power Requirements	.120/240V AC, 50/60Hz, AC Adapter/Charger
Battery Type and Life	. Nickel-Cadmium Rechargeable, Approx. 3 Hours
Temperature	
Operating	40°F-100°F (4°C-38°C)
Storage	-40°F- 150°F (-40°C- 66°C)
Humidity:	
Operating	Max 80%
Storage	Max 80%
Display Type	1:1 Aspect Ratio Triple Supertwist VGA LCD, Blue Characters/White Background with FL Sidelight
Screen Size	.640 x 480 Pixels, 80 Characters x 25 Lines (VGA)
Hard Disk Drive	. 2 1/2-inch, 60MB or 80MB Capacity with 19 msec Seek Time
Diskette Drive Capacity	1.44MB/720KB (Formatted)
Media Standards	.3 1/2-Inch, Double-Sided, 720KB, 80 Tracks, 9 Sectors 1.44MB, 80 Tracks, 18 Sectors
Interfaces	.Serial DB-9, Parallel DB-25, VGA Video, PS/2 Keyboard, RJ-11
RAM	2MB (Expandable to 4MB or 8MB)

INDEX

USA WARRANTY

CUSTOMER OBLIGATIONS

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INTERNATIONAL NOTES

The following notes are for international customers:

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, dass der Gerät 1755 in Übereinstimmung mit den Bestimmungen der Vfg 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmung eingeräumt.

GRiD Systems Corporation
47211 Lakeview Boulevard
Fremont, California 94538-6599

Achtung: Zur Trennung vom Netz ist der Netzstecker aus der Steckdose zu ziehen, welche sich in der Nähe des Gerätes befinden muß und leicht zugänglich sein soll.

Diese Komponente wurde als Teil einer Zentraleinheit in Gesamtkonfiguration geprüft. Als Bildschirmarbeitsplatz, wie in ZH 1/618/10.80 beschrieben, darf sie nur als Zentraleinheit mit externer GS-geprüfter Tastatur und GS-geprüftem Monitor benutzt werden. (Der Benutzer, der dieses System integriert, ist verpflichtet, das Gesamtsystem in Übereinstimmung mit den Sicherheiteregein für Bildschirmarbeitsplätze im Bürobereich (ZH 1/618/10.80) zu bringen. Dies trifft auch für Software zu (Zitat aus: Protokoll des Fachausschusses für Verwaltung, Hamburg, Dezember 1990).

"Diese Gerät muß außerhalb des Sichtfeldes plaziert werden, da die Farbe nicht den Anforderungen von ZH 1/618 entspricht."

English Translation:

Manufacturer/Importer Certificate

We hereby certify that the GRiD 1755 complies with the RFI suppression requirements of Vfg 1046/1984. The German Postal Service was notified that equipment is being marketed. The German Postal Service has the right to re-test the equipment and verify compliance.

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Fremont, California 94538-6599

Warning: Unplug the adapter from the AC outlet before you disconnect it from the computer.

This component has been tested as a central processing unit as part of a system configuration. In display work places as defined in ZH 1/618, 10.80, it is only to be used as a central processing unit with an external GS-approved monitor and keyboard. [The user who combines this component in a system configuration is obliged to make sure that the entire system complies with the "Safety regulations for display work places in the office sector" (ZH 1/618). This also applies to the software. (Quote: Protocol of Fachausschuß Verwaltung, Hamburg, Dezember 1990)]

"The device has to be located outside of the viewing field, as color does not comply w/ZH 1/618.10.80."

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10/91-SWCG

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